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3-2" minimum spare conduits required for future use shall be stubbed out and capped. Note that additional spare conduits may be required by the contract documents.

1-1" min. conduit required for grounding electrode conductor.

The anchor bolts shall extend 1/4" to 3/4" above the top of the nut after installation of the nuts, washers and cabinet.

Notes:
1. Anchor bolts and bolt template shall be furnished with cabinet.
2. Cabinet shall be centered on foundation.
3. The controller cabinet at the inside and outside foundation joints shall be sealed with an approved waterproof silicone sealant.
4. Foundation length and width shall project a minimum 4" beyond all sides of the cabinet.
5. Excavated areas shall be backfilled with aggregate.
6. CF-1 foundation is intended for use with Type "A" (NEMA TS-2) traffic signal equipment cabinet.
NOTES:
1. ANCHOR BOLTS AND BOLT TEMPLATE SHALL BE FURNISHED WITH CABINET.
2. CABINET SHALL BE CENTERED ON FOUNDATION.
3. THE CONTROL CENTER CABINET AT THE INSIDE AND OUTSIDE FOUNDATION JOINTS SHALL BE SEALED WITH AN APPROVED WATERPROOF SILICONE SEALANT.
4. FOUNDATION LENGTH AND WIDTH SHALL PROJECT A MINIMUM 4" BEYOND ALL SIDES OF THE CABINET.
5. EXCAVATED AREAS SHALL BE BACKFILLED WITH AGGREGATE.
6. TYPE A AND TYPE B TRAFFIC SIGNAL CABINETS SHALL NOT BE INSTALLED ON CF-2 FOUNDATIONS.
CABINET FOUNDATION DETAILS

TYPE B TRAFFIC SIGNAL EQUIPMENT

NOTES:

1. ANCHOR BOLTS, BOLT TEMPLATE, AND BASE ADAPTER (METAL RISER) SHALL BE FURNISHED WITH CABINET.

2. CABINET ON BASE ADAPTER (METAL RISER) SHALL BE CENTERED ON FOUNDATION.

3. THE CONTROLLER CABINET AT THE INSIDE AND OUTSIDE FOUNDATION JOINTS SHALL BE SEALED WITH AN APPROVED WATERPROOF SILICONE SEALANT.

4. FOUNDATION LENGTH AND WIDTH SHALL BE AS REQUIRED TO PROJECT NO LESS THAN A MINIMUM 4" BEYOND ALL SIDES OF THE CABINET.

5. EXCAVATED AREAS SHALL BE BACKFILLED WITH AGGREGATE.

6. CF-3 FOUNDATION IS INTENDED FOR USE WITH TYPE "B" (CALTRANS MODEL 332) TRAFFIC SIGNAL EQUIPMENT CABINET.

7. CONDUITS ENTERING THE FOUNDATION SHALL BE ARRANGED IN A CIRCULAR PATTERN. THE CONTRACTOR SHALL SUBMIT A CONDUIT ARRANGEMENT PLAN FOR APPROVAL PRIOR TO PLACEMENT.
Communication Service Connection Detail

- Controller Cabinet
  - (Separate Pay Item)

- External Communications Interface Box
  - (Included in Controller Cabinet Pay Item)

- 1" Minimum Rigid Metal Conduit
  - (One-Piece, Bent)
  - (Separate Pay Item, as shown on Contract Documents)

- 2" Minimum Conduit
  - To Communication Connection

- Backfill with No. 25 or 26 Aggr. to 3" Below Foundation

- Maximum 2'

- J8-S1 Junction Box, Top of Junction Box shall read "VDOT COMM"
  - (Separate Pay Item, as shown on Contract Documents)

- Grounding Electrode

- 2" Minimum Conduit
  - To Communication Connection

A copy of the original sealed and signed drawing is on file in the Central Office.

Virginia Department of Transportation
**NOTES:**

1. **Anchor Bolts and Bolt Templates** shall be furnished with both cabinets.

2. **The Controller Cabinet and UPS Cabinet** shall be centered from front to back on the foundation. The total width of the controller cabinet and UPS cabinet shall be centered from side to side on the foundation.

3. **The Controller Cabinet and UPS Cabinet** at the inside and outside foundation joints shall be sealed with an approved waterproof silicone sealant.

4. The foundation width and length shall project a minimum 4" beyond all sides of the cabinets.

5. **Excavated Areas** shall be backfilled with aggregate.

6. **CF-4 Foundation** is intended for use with type "A" (NEMA TS-2) Traffic Signal Equipment Cabinet with separate UPS cabinet.

7. **Door Hinge Locations** shall be in accordance with Section 703 of the Specifications.

8. **Each Cabinet** shall have four ½" dia. x 16" long with 2" 90 degree bend anchor bolts.
A "J" hook for wire support shall be placed near the top of the inside of each pole.

Span sag after loading shall be no greater than 5% of its length and no less than 3.5%.

**NOTES:**

A. As required by plans (height includes transformer base when required).

B. Pole height designed to accommodate attaching span across the greatest distance at a point 18" from the top of the pole. Spans crossing a lesser distance and attached to the same pole shall be attached lower than 18" as doing so will result in the lowest signal head section maintaining the minimum clearance, using no extensions as shown by standard SW-1 and SW-2.

C. Minimum 16' clearance from highest point of the pavement surface to the lowest point of signal head assembly including backplate and tether clamp (includes signal heads on bridle span).

D. Wiring and rigging shall be in accordance with standard WD-1. Tether rigging shall be in accordance with standard TA-1.

E. Handhole cover with chain

SPECIFICATION REFERENCE

STRAIN AND COMBINATION LUMINAIRE STRAIN POLE

VIRGINIA DEPARTMENT OF TRANSPORTATION
NOTES:

1. AS REQUIRED BY THE SPECIFICATIONS.

2. SIGNAL WIRING HOLE SHALL BE LOCATED ON THE BOTTOM OF THE ARM DIRECTLY BEHIND THE HANGER ASSEMBLY WHEN STANDARD SM-3 HANGER ASSEMBLIES ARE REQUIRED. SIGNAL WIRING SHALL BE CONCEALED IN THE STANDARD SM-3 HANGER ASSEMBLIES.

3. THE ALIGNMENT OF THE LUMINAIRE ARM SHALL BE AS SHOWN IN THE CONTRACT DOCUMENTS.

4. AFTER THE LOADS ARE APPLIED, THE VERTICAL CLEARANCE FROM THE HIGHEST POINT OF THE PAVEMENT SURFACE SHALL BE:
   A. 10' MINIMUM (15' MINIMUM FOR MAINTENANCE ACTIVITIES) TO THE LOWEST POINT OF THE SIGNAL HEAD ASSEMBLIES (INCLUDING BACKPLATES) AND SIGNS.
   B. 25' MAXIMUM TO THE TOPS OF THE SIGNAL HOUSINGS.

5. THE MOUNTING HEIGHT FROM THE PEDESTRIAN PATH OR THE HIGHEST POINT OF THE PAVEMENT SURFACE IF THERE IS NO PEDESTRIAN PATH TO THE LOWEST POINT OF THE SIGNAL HOUSING (INCLUDING BRACKETS AND BACKPLATES) SHALL BE AS PER THE CONTRACT DOCUMENTS.

6. A "J" HOOK FOR WIRE SUPPORT SHALL BE PLACED NEAR ALL HANDHOLES THAT ARE LOCATED MORE THAN 4 FEET UP THE STRUCTURE.

7. MAST ARMS MAY BE SPLICED. IF SPLICED, FIELD ASSEMBLY SHALL ACHIEVE A SNUG TIGHT JOINT. MATING SURFACES SHALL BE SMOOTH AND FREE OF BURRS, DENTS, OR LUMPS OF ZINC.

8. POLE CLAMP SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS WITHOUT THE USE OF SPACERS OR SHIMS.

9. MAST ARMS SHALL BE CONNECTED TO THE POLE USING THRU-BOLTS. NEITHER WELDED STUDS NOR THREADED PLATES WILL BE ALLOWED.

10. DUAL MAST ARM CONNECTIONS MAY BE MADE BY USING TWO SINGLE ARM CONNECTIONS WITH THE LONGER MAST ARM ON THE BOTTOM.

11. SEE THE CONTRACT DOCUMENTS FOR ANGLE BETWEEN DUAL MAST ARMS.
NOTES:

1. THESE LOADING REQUIREMENTS SHALL BE USED FOR THE DESIGN OF ALL NEW MAST ARM STRUCTURES, EXCEPT IN THE FOLLOWING SITUATIONS WHERE THE STRUCTURE SHALL REQUIRE A PROJECT-SPECIFIC DESIGN:
   - THE WIND LOADS OR DEAD LOADS ON THE MAST ARM STRUCTURE SPECIFIED ON THE PLANS WILL EXCEED WHAT IS SHOWN ON THIS STANDARD FOR THE PROPOSED ARM LENGTH.
   - THE STRUCTURE IS A DUAL ARM STRUCTURE WHERE THE ARMS ARE NOT AT 90 DEGREES TO EACH OTHER.

2. EMERGENCY VEHICLE PREEMPTION DEVICES, PEDESTRIAN PUSH BUTTONS, AND ANTENNAE SHALL BE CONSIDERED TO HAVE NEGLIGIBLE WEIGHT AND SURFACE AREA FOR THE PURPOSES OF STRUCTURAL DESIGN OF THE MAST ARM POLES AND FOUNDATIONS.

3. FOR DUAL MAST ARM STRUCTURES WITH TWO ARMS AT 90 DEGREES TO EACH OTHER, THE POLE AND FOUNDATION SHALL BE DESIGNED FOR THE WORST-CASE DEAD LOAD AND WIND LOAD CONDITIONS FROM EITHER ARM.

4. FOR THE PURPOSES OF WIND LOAD ANALYSIS, ALL LOADS SHALL BE TREATED AS IF THEY ARE POINTED IN THE SAME DIRECTION IFACING WIND. THERE SHALL BE NO DEDUCTIONS FOR DEVICES MOUNTED AT ANGLES.

5. THE AREAS PROVIDED DO NOT TAKE INTO ACCOUNT THE WIND DRAG COEFFICIENT.

6. UNLESS SPECIFIED OTHERWISE IN THE CONTRACT DOCUMENTS, EQUIPMENT LOADS AND SIZES SHOWN IN THIS STANDARD SHALL BE USED FOR THE STRUCTURE AND FOUNDATION DESIGN, EVEN IF LIGHTER LOADS OR SMALLER EQUIPMENT SIZES ARE PROPOSED.

<table>
<thead>
<tr>
<th>DEVICE</th>
<th>SURFACE AREA</th>
<th>DEAD LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-SECTION SIGNAL HEAD W/ BACKPLATE</td>
<td>8.7 SF</td>
<td>65 LBS</td>
</tr>
<tr>
<td>4-SECTION SIGNAL HEAD W/ BACKPLATE</td>
<td>11.0 SF</td>
<td>80 LBS</td>
</tr>
<tr>
<td>5-SECTION SIGNAL HEAD W/ BACKPLATE (IN-LINE)</td>
<td>13.4 SF</td>
<td>95 LBS</td>
</tr>
<tr>
<td>5-SECTION SIGNAL HEAD W/ BACKPLATE (DOGHOUSE/CLUSTER)</td>
<td>13.75 SF</td>
<td>105 LBS</td>
</tr>
<tr>
<td>SP-9 PEDESTRIAN SIGNAL HEAD</td>
<td>2.4 SF</td>
<td>30 LBS</td>
</tr>
<tr>
<td>30&quot; x 36&quot; SIGN</td>
<td>7.5 SF</td>
<td>22.5 LBS</td>
</tr>
<tr>
<td>36&quot; x 42&quot; SIGN</td>
<td>10.5 SF</td>
<td>26.7 LBS</td>
</tr>
<tr>
<td>12&quot; x 2.5&quot; STREET NAME SIGN</td>
<td>3.0 SF</td>
<td>66 LBS</td>
</tr>
<tr>
<td>15&quot; x 2.5&quot; STREET NAME SIGN</td>
<td>3.75 SF</td>
<td>88.5 LBS</td>
</tr>
<tr>
<td>VIDEO CAMERA</td>
<td>1.00 SF</td>
<td>22 LBS</td>
</tr>
</tbody>
</table>
NOTES:

EACH FOUNDATION SHALL BE PERMANENTLY MARKED TO INDICATE ALL SIDES FROM WHICH CONDUITS PASS. THIS MARK SHALL BE MADE WITH A TROWEL WHEN FINISHING THE CONCRETE AND SHALL BE 1/4" DEEP AND 4" TO 6" LONG.

WHEN FOUNDATION EXTENDS 2" ABOVE FINISHED GRADE, ALL EDGES SHALL BE CHAMFERED 3/4".

GROUNDING BUSHINGS SHALL BE INSTALLED ON EACH END OF METAL CONDUITS.

EMPTY CONDUITS SHALL BE PLUGGED TO PREVENT MOISTURE AND RODENT ENTRY.

BELL ENDS SHALL BE INSTALLED ON EACH END OF PVC CONDUITS.

PEDESTAL POLE SHALL HAVE A BREAKAWAY BASE, EITHER SLIP BASE OR FRANGIBLE TRANSFORMER TYPE, 3" X 5" MINIMUM CURVED HANDBOULE WITH FRAME AND COVER REQUIRED IN POLE WHEN SLIP BASE SUPPLIED.

DISTANCE FROM BOTTOM OF POLE TO CENTER OF HANDBOULE SHALL BE 12".

FOUNDATION TO EXTEND 2" ABOVE GROUND WHEN IN EARTH AND SHALL BE FLUSH WITH SURFACE WHEN IN SIDEWALK.

REFER TO STANDARD MP-2 FOR GROUNDING LUG DETAIL.

OPEN ENDS OF CONDUITS WITH CONDUCTORS INSTALLED SHALL BE SEALED WITH AN APPROVED SOFT, PLIABLE, AND EASILY REMOVABLE WATERPROOF SEALANT. THE SEALANT SHALL NOT HAVE A DELETERIOUS EFFECT ON CABLE COVERINGS.

PEDESTAL POLE AND FOUNDATION
DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION
NOTES:

1. Signal heads and signs mounted on the same span wire shall be installed on a level plane within the height clearance requirement in TA-1.

2. Conductor cables shall be continuous from the cabinet to the nearest signal head to which it applies except cable terminations may be allowed on the pole terminal strip when required by the contract documents. The cable shall also be continuous from the first signal head to any additional signal heads with termination on the terminals within the signal head housing.

3. Spacers shall be installed between the eyelet of the hanger assembly and the inside of the span wire clamp to eliminate any gap.

4. Backplates intentionally not shown so equipment detail could be shown more clearly.

5. See TA-1 for tether wire and clamp details.
NOTES:

1. SIGNAL HEADS AND SIGNS MOUNTED ON THE SAME SPAN WIRE SHALL BE INSTALLED ON A LEVEL PLANE WITHIN THE HEIGHT CLEARANCE REQUIREMENT IN TA-1.

2. CONDUCTOR CABLES SHALL BE CONTINUOUS FROM THE CABINET TO THE NEAREST SIGNAL HEAD TO WHICH IT APPLIES EXCEPT CABLE TERMINATIONS MAY BE ALLOWED ON THE POLE TERMINAL STRIP WHEN REQUIRED BY THE CONTRACT DOCUMENTS. THE CABLE SHALL ALSO BE CONTINUOUS FROM THE FIRST SIGNAL HEAD TO ANY ADDITIONAL SIGNAL HEADS WITH TERMINATION ON THE TERMINALS WITHIN THE SIGNAL HEAD HOUSING.

3. SPACERS SHALL BE INSTALLED BETWEEN THE EYELET OF THE HANGER ASSEMBLY AND THE INSIDE OF THE SPAN WIRE CLAMP TO ELIMINATE ANY GAP.

4. BACKPLATES INTENTIONALLY NOT SHOWN SO EQUIPMENT DETAIL COULD BE SHOWN MORE CLEARLY.

5. SEE TA-1 FOR TETHER WIRE AND CLAMP DETAILS.

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.
NOTES:
SIGNAL HEAD CABLES SHALL BE CONTINUOUS FROM THE CONTROLLER TO THE NEAREST SIGNAL HEAD TO WHICH IT APPLIES EXCEPT CABLE TERMINATIONS MAY BE ALLOWED ON THE POLE TERMINAL STRIP WHEN REQUIRED BY THE PLANS. THE CABLE SHALL ALSO BE CONTINUOUS FROM THE FIRST SIGNAL HEAD TO ANY ADDITIONAL HEADS WITH TERMINATION ON THE TERMINALS WITHIN THE SIGNAL HEAD HOUSING.

POLE AND HANGER ASSEMBLY
HARDWARE REQUIREMENTS

<table>
<thead>
<tr>
<th>POLE TYPE</th>
<th>HARDWARE TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GALVANIZED STEEL</td>
<td>ALUMINUM OR GALVANIZED IRON</td>
</tr>
<tr>
<td>STEEL PAINTED ALUMINUM</td>
<td>ALUMINUM, GALVANIZED IRON OR IRON PAINTED ALUMINUM</td>
</tr>
<tr>
<td>STEEL PAINTED OTHER THAN ALUMIN</td>
<td>ALUMINUM OR IRON PAINTED TO MATCH POLE</td>
</tr>
</tbody>
</table>

RIGID MAST ARM MOUNTING DETAILS

COVERED SLOT
SLOTTED, GUSSETED TUBE TO BE PROVIDED FOR SIGNAL CABLE RUN

COVER
LOCK WASHER
NUT
Pole Top Mounting Cast Aluminum Signal Heads Only

NOTES:
1. If pedestrian signal heads are being installed, the mounting attachments shall be a type specifically manufactured for that purpose.
2. Mounting brackets shown are typical and for one-way and multi-way signal displays.
3. Backplates intentionally not shown so equipment detail could be shown more clearly.
4. Signal heads may be mounted using tri-stud assemblies instead of the cast nipple assemblies.
POLE TOP MOUNTING CAST ALUMINUM OR POLYCARBONATE SIGNAL HEADS

NOTES:
1. IF PEDESTRIAN SIGNAL HEADS ARE BEING INSTALLED, THE MOUNTING ATTACHMENTS SHALL BE A TYPE SPECIFICALLY MANUFACTURED FOR THAT PURPOSE.
2. MOUNTING BRACKETS SHOWN ARE TYPICAL AND FOR ONE-WAY AND MULTI-WAY SIGNAL DISPLAYS.
3. SET SCREWS SHALL BE STAINLESS STEEL.
4. SIGNAL HEADS MAY BE MOUNTED USING TRI-STUD ASSEMBLIES INSTEAD OF THE CAST NIPPLE ASSEMBLIES.
NOTES:

1. If pedestrian signal heads are being installed, the mounting attachments shall be a type specifically manufactured for that purpose.

2. Mounting bracket shown is typical and for one-way signal displays.

3. Brackets shall be mounted to pole with stainless steel bands. Instead of stainless steel bands, steel poles may be drilled and tapped and mounting accomplished utilizing 1/2" stainless steel bolts.

4. Set screws shall be stainless steel.

5. If SMB-3 is to be mounted on wood pole, a conduit body shall be installed in bracket arm to connect signal head cable conduit.

6. Signal heads may be mounted using tri-stud assemblies instead of the cast nipple assemblies.

A copy of the original sealed and signed drawing is on file in the central office.

SIGNAL HEAD MOUNTING DETAILS
POLE SIDE MOUNTING BRACKET
ROAD AND BRIDGE STANDARDS
SHEET 1 OF 1
NEW 02/16

- **VIRGINIA DEPARTMENT OF TRANSPORTATION**
- **POLE BRACKET MOUNTING CAST ALUMINUM OR POLYCARBONATE SIGNAL HEADS**
- **REFERENCE SPECIFICATION**
- **NOTE 3.**
- **NOTE 4.**
- **SMB-3**
- **REVISION DATE 1303.42**
- **CONDUCTOR CABLE**
- **METAL SERRATED LOCKING RING**
- **NEOPRENE O-RING**
- **STAINLESS STEEL BAND (WHEN BANDED)**
- **CAST NIPPLE**
- **SEE NOTE 4**
- **STAINLESS STEEL BAND (WHEN BANDED)**
- **1/2" HOLE (WHEN BOLTED), SEE NOTE 3.**
- **STEEL OR WOOD POLE AS SHOWN ON CONTRACT DOCUMENTS**
- **POLYCARBONATE SIGNAL HEADS**
- **AN APPROVED WATERPROOF SILICONE SEALANT SHALL BE APPLIED ON THE OUTSIDE OF THE CONNECTION BETWEEN THE MOUNTING BRACKET AND SIGNAL HEAD**

---

*Image and diagram not transcribed due to nature of information.*
NOTES:

1. WIRING AND RIGGING SHALL BE IN ACCORDANCE WITH STANDARD WD-1 AND WD-2.

2. REFER TO STANDARD SMD-1 FOR SIGN PANEL ATTACHMENT DETAIL.

3. AFTER THE LOADS ARE APPLIED, THE VERTICAL CLEARANCE FROM THE HIGHEST POINT OF THE PAVEMENT SURFACE SHALL BE:

   A. 16' MINIMUM (15' MINIMUM FOR MAINTENANCE ACTIVITIES) TO THE LOWEST POINT OF THE SIGNAL HEAD ASSEMBLY (INCLUDING BACKPLATE) AND SIGNS.

   B. 25' MAXIMUM TO THE TOP OF THE SIGNAL HOUSING.

FRONT VIEW

SIDE VIEW

ADJUSTABLE TETHER CLAMP

THIMBLEYE BOLT, NUT AND WASHERS

COMPRESSION DEAD-END CLAMP

SLEEVE

LOCK WASHER

FLAT WASHER

THREE BOLT CLAMP OR COMPRESSION DEAD-END CLAMP

BOTTOM OF SIGNAL HEAD HOUSING

FLAT WASHER

LOCK WASHER

SIGNAL HEAD

FIVE-SECTION HEAD CLUSTER TETHER CLAMP

TETHER CLAMP

WIRING AND RIGGING SHALL BE IN ACCORDANCE WITH STANDARD WD-1 AND WD-2.

REFER TO STANDARD SMD-1 FOR SIGN PANEL ATTACHMENT DETAIL.

AFTER THE LOADS ARE APPLIED, THE VERTICAL CLEARANCE FROM THE HIGHEST POINT OF THE PAVEMENT SURFACE SHALL BE:

A. 16' MINIMUM (15' MINIMUM FOR MAINTENANCE ACTIVITIES) TO THE LOWEST POINT OF THE SIGNAL HEAD ASSEMBLY (INCLUDING BACKPLATE) AND SIGNS.

B. 25' MAXIMUM TO THE TOP OF THE SIGNAL HOUSING.

SPECIFICATION REFERENCE

703

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

TETHER WIRE DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

ROAD AND BRIDGE STANDARDS

REVISION DATE 02/16

SHEET 1 OF 1

1304.10
EXTENSION SHALL BE USED WITH THE HANGER AND TETHER ASSEMBLY TO CENTER THE SIGN WITH THE SIGNAL HEADS.

NOTES:

NUTS AND BOLTS USED FOR ATTACHMENT OF SIGN PANEL SHALL BE STAINLESS STEEL AND 5/16" IN DIAMETER.

A 1 1/8" NYLON AND STAINLESS STEEL FENDER WASHER SHALL BE USED ON THE FRONT OF SIGN PANEL WHERE BOLT PASSES THROUGH SIGN PANEL.

ALL NUTS, BOLTS AND WASHERS SHALL BE STAINLESS STEEL OR GALVANIZED STEEL UNLESS OTHERWISE INDICATED.

SPACERS SHALL BE INSTALLED BETWEEN THE EYELET OF THE SIGN HANGAR AND THE SPAN WIRE CLAMP TO ELIMINATE ANY GAP.
SPAN SAG AFTER LOADING SHALL BE NO GREATER THAN 5% OF ITS LENGTH AND NO LESS THAN 3.5%.

NOTES:

1. CONCRETE PAD REQUIRED WHEN CABINET MOUNTED ON POLE IN EARTH AREAS, SIZED AS SPECIFIED IN CONTRACT DOCUMENTS.
2. FOR METHODS APPROVED FOR CABLE RUNS, SEE STANDARD WD-2.
4. A STRAIN INSULATOR(S) MAY BE USED TO EXTEND THE LENGTH OF EXISTING SPAN WIRE IF A SPAN PULL IS TO BE MODIFIED.
NOTES:

1. Concrete pad required when cabinet mounted on pole in earth areas, sized as specified on contract documents.

2. All spans shall maintain the minimum clearance between pavement surface and lowest signal head, as shown by Standard MP-2.

3. A strain insulator(s) may be used to extend the length of existing span wire if a span pull is to be modified.

4. Cabinet shall be mounted to allow adequate clearance between open cabinet door, guy wires, and associated hardware.

5. Contractor shall furnish the design of wood pole to include class, type, depth, and guy wire size and placement unless otherwise specified by contract documents.

METHODS APPROVED FOR CABLE RUNS (TOP VIEW)

ANGLES LESS THAN 160°

- 3" FLAT SQUARE WASHERS
- THIMBLEYE BOLTS
- GUY SLEEVE
- CABLE TIE

ANGLES GREATER THAN 160°

- 3" FLAT SQUARE WASHER
- THIMBLEYE BOLTS
- CABLE TIE
PEDESTRIAN ACTUATION DETAILS

WOOD/CONCRETE POLE

PA-1

- R10-3 SERIES SIGN AS SPECIFIED IN THE CONTRACT DOCUMENTS
- STAINLESS STEEL POLE BANDS OR OTHER APPROVED METHOD
- PEDESTRIAN PUSH BUTTON
- 1" METAL CONDUIT
- "C" CONDULET WITH COVER AND GASKET
- 1" METAL CONDUIT
- CONDUCTORS
- STAINLESS STEEL POLE BANDS OR OTHER APPROVED METHOD
- GROUNDING ELECTRODE CONDUCTOR
- CONDUCTORS
- GROUNDING LUG
- GROUNDING BUSHING
- GROUNDING ELECTRODE
- TO JUNCTION BOX
- TO JUNCTION BOX

SIGNAL/PEDESTAL POLE

PA-2

- PEDESTRIAN PUSH BUTTON
- 2 -1/4" BOLTS GALVANIZED OR STAINLESS STEEL
- GROUNDING ELECTRODE CONDUCTOR
- CONDUCTORS
- GROUNDING LUG
- GROUNDING BUSHING
- GROUNDING ELECTRODE
- TO JUNCTION BOX
- TO JUNCTION BOX

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

ROAD AND BRIDGE STANDARDS

REVISION DATE
02/16

SHEET 1 OF 2
1307.10
NOTES:

1. IF POLE SHAFT SCREWS INTO TRANSFORMER BASE INSTEAD OF BEING WELDED, THREE SET SCREWS OR OTHER
   APPROVED METHOD SHALL BE USED TO LOCK SHAFT IN POSITION.

2. PEDESTAL POLE SHALL HAVE A BREAKAWAY TRANSFORMER TYPE BASE. THE TRANSFORMER BASE SHALL BE
   INSTALLED PER THE MANUFACTURER’S SPECIFICATIONS.

3. SEE PEDESTAL POLE STANDARDS (PF-2) FOR INSTALLATION DETAILS.

4. STRUCTURAL TUBE MATERIAL SHALL BE ALUMINUM 6061-T6 WITH MINIMUM 0.337" WALL THICKNESS.
NOTES:

1. COUNTDOWN DISPLAYS (SP-8, SP-9) SHALL BE PROVIDED WHERE THE PEDESTRIAN CHANGE INTERVAL IS GREATER THAN 7 SECONDS.
NOTES:
REFER TO STANDARD MP-2 FOR GROUNDING LUG DETAIL.
ALL SIGNAL LENSES SHALL BE YELLOW AND SHALL BE 12" DIAMETER.
ALL ELBOWS AND CONDUITS SHALL HAVE SET SCREWS TO PREVENT
ROTATION.
ALL CHANNELING AND CLAMPS SHALL BE GALVANIZED OR STAINLESS
STEEL.
MISCELLANEOUS HARDWARE SHALL BE STAINLESS STEEL.
POST AND SIGN PANELS SHALL BE INSTALLED IN ACCORDANCE WITH
SSP-VA.
A WATERPROOF SEALANT SHALL BE UTILIZED BETWEEN ELBOWS
AND SIGNAL HEADS.
BREAKAWAY CONNECTORS SHALL BE INSTALLED ON THE SIGNAL
CONDUCTORS WITH THE TYPE C CONDUIT. BREAKAWAY CONNECTORS
SHALL BE FUSED FOR THE HOT CONDUCTOR AND NONFUSED
FOR THE GROUNDED CONDUCTOR.
OPEN ENDS OF CONDUITS WITH CONDUCTORS INSTALLED SHALL BE
SEALED WITH AN APPROVED SOFT, PLiable, AND EASILY REMOVABLE,
WATERPROOF SEALANT. THE SEALANT SHALL NOT HAVE A DELETERIOUS
ON CABLE COVERINGS.
FOUNDATION SHALL BE IN ACCORDANCE WITH SSP-VA FOR A 4'6" X 1'9"
FOUNDATION EXCEPT FOR THE FOLLOWING:
1. A 1 1/2" METAL CONDUIT SHALL BE INSTALLED FOR ELECTRICAL POWER.
2. A 1" PVC CONDUIT, NO. 6 GROUNDING CONDUCTOR AND GROUNDING
ELECTRODE SHALL BE INSTALLED FOR GROUNDING PURPOSES. STUB
POST SHALL BE SUPPLIED WITH A GROUNDING LUG WELDED TO POST
WEB.
3. FLASHING BEACON INSTALLED ON UNDIVIDED HIGHWAYS SHALL BE OF
THE MEDIAN TYPE INSTALLED IN ACCORDANCE WITH STANDARD SSP-VA.
**NOTES:**

1. Anchor bolts shall have a ring or nuts and washers on the ends of bolts embedded in foundation.

2. Anchor bolt layout shall be checked against latest approved structure drawings. A minimum of eight 2" diameter anchor bolts are required.

3. All conduits as specified in the contract documents. In addition, 1" conduit required for ground electrode conductor. 2" PVC conduits required for future use. Note that additional spare conduits may be required by the contract documents.

4. If needed in sloped conditions to maintain positive drainage around the foundation and to provide the clearances shown in detail A, the contractor shall re-grade and add retaining curb or material on the up slope when approved by the engineer. Re-grading and retaining curb shall be included in the price bid for foundation.

5. Foundation shall be designed for torsion. Wings may be used for torsional resistance if required.

6. Anchor bolts and bolt template shall be furnished with pole. Pole shall be centered on foundation.

7. Each foundation shall be permanently marked to indicate all sides from which conduits pass. This mark shall be made with a trowel when finishing the concrete and shall be 1/4" deep and 4" to 6" long. Locations of empty conduits shall have an additional 2" long mark made perpendicular to and centered on this marking.

8. Grounding bushings shall be installed on each end of metal conduits.

9. Empty conduits shall be plugged to prevent moisture and rodent entry.

10. Bell ends shall be installed on each end of PVC conduits.

11. No mortar, grout, or concrete shall be placed between bottom of base plate and top of foundation.

12. Height, width, depth, and reinforcement of foundation shall be as required by foundation designer.

13. Open ends of conduits with conductors installed shall be sealed with an approved outdoor, waterproof, silicone sealant. The sealant shall not have a deleterious effect on cable coverings.

14. Foundations shall not be installed in the center of a drainage ditch if approved by the engineer. Foundations may be installed in the slope of a drainage ditch at an approved height above grade. The foundation shall not be placed in the front slope unless the engineer determines that back slope placement is not feasible.

15. The edge of the foundation shall be 1'-0" min. from the edge of a pedestrian path, or 3'-0" min. from the edge of a shared use path (see detail B). If approved by the engineer, foundations may be placed immediately adjacent to pedestrian path.

16. Spread footing may be used if approved by the engineer.
SIGNAL POLE FOUNDATION
INSTALLATION DETAILS

DETAIL A
FOUNDATION NOT IN
SIDEWALK DETAIL

MIN. 2'-0" SOIL COVER

MIN. 12"

MIN. 2'-0"

MAX. 4'-0" UNLESS
DIRECTED OTHERWISE
BY THE ENGINEER

DETAIL B
FOUNDATION ADJACENT
TO SIDEWALK DETAIL

MIN. 2'-0" SOIL COVER

SIDEWALK OR PEDESTRIAN
ACCESS ROUTE

SEE NOTE 15

ANCHOR BOLTS

12" MIN.

5'-0" MIN.

12" MIN.

4'-0" MAX. UNLESS
DIRECTED OTHERWISE
BY THE ENGINEER

DISTANCE BETWEEN BOTTOM OF
BASE PLATE AND TOP OF
FOUNDATION SHALL BE NO
GREATER THAN THE DIAMETER OF
ANCHOR BOLT PLUS ONE INCH.

DETAIL C
ALTERNATE FOUNDATION
ADJACENT TO SIDEWALK DETAIL
(IF APPROVED BY THE ENGINEER)

MIN. 2'-0" SOIL COVER

1/4" MIN. PROJECTION
ABOVE TOP NUT

LEVELING NUTS AND WASHERS

ANCHOR BOLTS

CIRCULAR BASE PLATE

DETAIL D
ANCHOR BOLT AND BASE
PLATE CONNECTION DETAIL

MIN. 2'-0"

1/4" DIA. ANCHOR BOLTS

2" DIA. ANCHOR BOLTS

PREFORMED JOINT FILLER

1/4" PREFORMED JOINT FILLER

(1/4) MIN. PROJECTION
ABOVE TOP NUT

BOLT PROJECTION AS
REQUIRED BY SIGNAL
POLE MANUFACTURER

12" MIN.

4'-0" MAX. UNLESS
DIRECTED OTHERWISE
BY THE ENGINEER

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

SIGNAL POLE FOUNDATION
INSTALLATION DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

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SIGNAL POLE FOUNDATION
INSTALLATION DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE
1. Conduit elbows shall have a 90° bend. The bend radius shall be in accordance with the NEC.

2. The bolt template shall be furnished by the lighting pole manufacturer. Pole shall be centered on foundation.

3. The number, orientation and size of conduits entering and exiting foundations shall be as shown in the contract documents. Each foundation shall be permanently marked to indicate all sides from which conduits pass. This mark shall be made with a trowel when finishing the concrete and shall be 1/4" deep and 4" to 6" long. Locations of empty conduits shall have an additional 2" long mark made perpendicular to and centered on this marking.

4. No mortar, grout, or concrete shall be placed between bottom of base plate and top of foundation.

5. Grounding bushings shall be installed on each end of metal conduits.

6. Empty conduits shall be plugged to prevent moisture and rodent entry.

7. Bell ends shall be installed on each end of PVC conduits.

8. Open ends of conduits with conductors installed shall be sealed with an approved soft, pliable, and easily removable waterproof sealant. The sealant shall not have a deleterious effect on cable coverings.

9. Anchor bolts shall be straight. Threaded reinforcing steel is not allowed.

10. Foundations shall not be installed in the center of a drainage ditch. Foundations may be installed in the front or back slope of a drainage ditch, but shall not impede the drainage flows. Tops of foundations adjacent to any ditch shall be above grade and above the anticipated water levels.

11. D is the minimum distance from the bottom of the pole foundation to the bottom of the sidewalk or the point of lowest graded elevation adjacent to the foundation.
**NOTES:**


2. IF NEEDED IN SLOPED CONDITIONS TO MAINTAIN POSITIVE DRAINAGE AROUND THE FOUNDATION AND TO PROVIDE THE CLEARANCES SHOWN IN DETAIL B, THE CONTRACTOR SHALL RE-GRADE AND ADD RETAINING CURB OR MATERIAL ON THE UP SLOPE WHEN APPROVED BY THE ENGINEER. RE-GRADING AND RETAINING CURB SHALL BE INCLUDED IN THE PRICE BID FOR FOUNDATION.

3. WHEN FOUNDATION IS ADJACENT TO THE BACK EDGE OF SIDEWALK BUT NOT WITHIN THE SIDEWALK, AND A BREAKAWAY BASE IS REQUIRED, THE TOP OF THE FOUNDATION SHALL BE ELEVATED 2 INCHES MINIMUM ABOVE THE SIDEWALK GRADE.
NOTES:
The mounting height shown on the plans shall be adhered to within a tolerance of 12" and in no case less than the mounting height shown.

Grounding electrode shall be covered 4-18" from finished grade.

Refer to standard MP-2 for grounding lug detail.

NOTES:
Grounding electrode shall be covered 4-18" from finished grade.

Refer to standard MP-2 for grounding lug detail.
NOTES:

WINCH ASSEMBLY AND CIRCUIT BREAKER TO BE ACCESSIBLE FROM HAND HOLE.

TYPE 9 POLES SHALL BE OF SUFFICIENT HEIGHT TO PROVIDE A LUMINAIRE MOUNTING HEIGHT ABOVE THE ROADWAY SURFACE AS INDICATED ON THE PLANS.

THE MOUNTING HEIGHTS SHOWN ON THE PLANS FOR A TYPE 9 POLE SHALL BE ADHERED TO WITHIN A TOLERANCE OF 3 FEET AND IN NO CASE BE LESS THAN THE MOUNTING HEIGHT SHOWN.

REFER TO STANDARD MP-2 FOR GROUNDING LUG DETAIL.

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NOTES:

1. LOCAL POWER UTILITY COMPANY WILL INSTALL SERVICE CABLE FROM THEIR POWER SOURCE TO THE TOP OF THE OVERHEAD SERVICE POLE AND MAKE REQUIRED SPLICES TO THE CABLES PROVIDED.

2. POLE WEIGHT AND SIZE WILL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

3. THIS STANDARD IS APPLICABLE FOR ALL ELECTRICAL SERVICES OTHER THAN 480Y/277.

4. FOR ROADWAY LIGHTING SYSTEMS, ONLY SAFETY SWITCH SHALL BE USED.

5. ALL ELECTRICAL CONNECTIONS AND SPLICES SHALL BE TESTED FOR ELECTRICAL CONTINUITY.

6. CONDUIT AND CONDUCTOR SIZE SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

7. RIGID METAL RISER CONDUIT AND SERVICE CABLE SIZE SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS, OR AS SPECIFIED BY THE LOCAL POWER COMPANY.

8. WHEN REQUIRED BY THE CONTRACT DOCUMENTS, AN ELECTRICAL SERVICE WORK PAD SHALL BE PLACED IN FRONT OF THE SAFETY SWITCH/BREAKER BOX. ELECTRICAL SERVICE WORK PAD SHALL BE A SEPARATE PAY ITEM.
NOTES:
1. LOCAL POWER UTILITY COMPANY WILL INSTALL SERVICE CABLE FROM THEIR POWER SOURCE TO THE JUNCTION BOX AND MAKE REQUIRED SPLICES TO THE CABLES PROVIDED.
2. POLE HEIGHT AND SIZE SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.
3. THIS STANDARD IS APPLICABLE FOR ALL ELECTRICAL SERVICES OTHER THAN 480Y/277.
4. FOR ROADWAY LIGHTING SYSTEMS, ONLY SAFETY SWITCH SHALL BE USED.
5. ALL ELECTRICAL CONNECTIONS AND SPLICES SHALL BE TESTED FOR ELECTRICAL CONTINUITY.
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NOTES:

1. LOCAL POWER UTILITY COMPANY WILL INSTALL SERVICE CABLE FROM THEIR POWER SOURCE TO THE TOP OF THE OVERHEAD SERVICE POLE (FOR TYPE A OVERHEAD SERVICE) OR THE JUNCTION BOX (FOR TYPE B UNDERGROUND SERVICE) AND MAKE REQUIRED SPLICES TO THE CABLES PROVIDED.

2. POLE HEIGHT AND SIZE WILL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

3. THIS STANDARD IS APPLICABLE FOR ALL ELECTRICAL SERVICES OTHER THAN 480Y/277.

4. FOR ROADWAY LIGHTING SYSTEMS, ONLY SAFETY SWITCH SHALL BE USED.

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8. WHEN REQUIRED BY THE CONTRACT DOCUMENTS, AN ELECTRICAL SERVICE WORK PAD SHALL BE PLACED IN FRONT OF THE SAFETY SWITCH/BREAKER BOX. ELECTRICAL SERVICE WORK PAD SHALL BE A SEPARATE PAY ITEM.
9. POLE AND CONTROLLER CABINET WILL BE SEPARATE PAY ITEMS.

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

VIRGINIA DEPARTMENT OF TRANSPORTATION

ELECTRICAL SERVICE
INSTALLATION DETAILS

AUGMENTED GROUNDING ELECTRODE

GROUNDING LUG

SERVICE ENTRANCE HEAD

SERVICE THIMBLEYE

SERVICE CABLE (3'-CABLE FOR POWER SERVICE HOOK-UP)

3" FLAT SQUARE WASHERS

RIGID METAL RISER CONDUIT WITH SERVICE CABLE

STAINLESS STEEL BANDS (3'-CENTERS)

METER BASE

STAINLESS STEEL BANDS

SAFETY SWITCH/BREAKER BOX

90° FITTINGS AND CLOSE NIPPLES

FEEDER CABLE

FOUNDERING LUG

HANDHOLE

TWO GROUNDING ELECTRODE CONDUCTORS (ONE TO SAFETY SWITCH/BREAKER BOX AND ONE TO GROUNDING LUG)

FEEDER CABLE

MINIMUM 1" CONDUIT

TYPE A (OVERHEAD SERVICE) METAL POLE

SEE NOTE 6
NOTES:

1. Local power utility company will install service cable from their power source to the junction box and make required splices to the cables provided.

2. Pole height and size will be as specified in the contract documents.

3. This standard is applicable for all electrical services other than 480Y/277.

4. For roadway lighting systems, only safety switch shall be used.

5. All electrical connections and splices shall be tested for electrical continuity.

6. Conduit and conductor size shall be as specified in the contract documents.

7. Rigid metal riser conduit and service cable size shall be as specified in the contract documents, or as specified by the local power company.

8. When required by the contract documents, an electrical service work pad shall be placed in front of the safety switch/breaker box. Electrical service work pad shall be a separate pay item.

A copy of the original sealed and signed drawing is on file in the central office.

Specifications reference: 700

Virginia Department of Transportation
NOTES:

1. Local power utility company will install service cable from their power source to the top of the overhead service pole (for type A overhead service) or the junction box (for type B underground service) and make required splices to the cables provided.

2. Pole height and size will be as specified in the contract documents.

3. This standard is applicable for all electrical services other than 480Y/277.

4. For roadway lighting systems, only safety switch shall be used.

5. All electrical connections and splices shall be tested for electrical continuity.

6. Conduit and conductor size shall be as specified in the contract documents, or as specified by the local power company.

7. When required by the contract documents, an electrical service work pad shall be placed in front of the safety switch/breaker box. Electrical service work pad shall be a separate pay item.

8. Augmented grounding electrode conductor to safety switch/breaker box w/ staples (6" centers)

9. Electrical service top of junction box shall read "VDOT Elec".

10. Underground service cable coiled in box with sufficient length to allow the cables to extend at least 2' above the junction box.

11. Minimum 2" PVC conduit stubout (location as required by utility company)

12. Grounding electrode

13. See note 6

**Electrical Service Installation Details**

**Type A (Overhead Service) Wood Pole**

**Type B (Underground Service) Wood Pole**

Virginia Department of Transportation

A copy of the original sealed and signed drawing is on file in the central office.
NOTES:

1. LOCAL POWER UTILITY COMPANY WILL INSTALL SERVICE CABLE FROM THEIR POWER SOURCE TO THE JUNCTION BOX AND MAKE REQUIRED SPLICES TO THE CABLES PROVIDED.

2. THIS STANDARD IS APPLICABLE FOR ALL ELECTRICAL SERVICES OTHER THAN 480Y/277.

3. FOR ROADWAY LIGHTING SYSTEMS, ONLY SAFETY SWITCH SHALL BE USED.

4. ALL ELECTRICAL CONNECTIONS AND SPLICES SHALL BE TESTED FOR ELECTRICAL CONTINUITY.

5. FOUNDATION SHALL BE CLASS A3 CONCRETE, 24X24 SQUARE OR 24" DIAMETER AND 24" DEEP, AND COST OF FOUNDATION SHALL BE INCLUDED WITH THE PAY ITEM FOR ELECTRICAL SERVICE.

6. CONDUIT AND CONDUCTOR SIZE SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

7. RIGID METAL RISER CONDUIT AND SERVICE CABLE SIZE SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS, OR AS SPECIFIED BY THE LOCAL POWER COMPANY.

8. WHEN REQUIRED BY THE CONTRACT DOCUMENTS, AN ELECTRICAL SERVICE WORK PAD SHALL BE PLACED IN FRONT OF THE SAFETY SWITCH/BREAKER BOX. ELECTRICAL SERVICE WORK PAD SHALL BE A SEPARATE PAY ITEM.

9. STAINLESS STEEL BANDS REQUIRED FOR METER BASE AND SAFETY SWITCH/BREAKER BOX.

10. ANCHOR BOLTS AND BOLT TEMPLATE SHALL BE FURNISHED BY POLE MANUFACTURER, AND POLE SHALL BE CENTERED ON FOUNDATION.
NOTES:

1. LOCAL POWER UTILITY COMPANY WILL INSTALL SERVICE CABLE FROM THEIR POWER SOURCE TO THE JUNCTION BOX AND MAKE REQUIRED SPLICES TO THE CABLES PROVIDED.

2. THIS STANDARD IS APPLICABLE FOR ALL ELECTRICAL SERVICES OTHER THAN 480Y/277.

3. ALL ELECTRICAL CONNECTIONS AND SPLICES SHALL BE TESTED FOR ELECTRICAL CONTINUITY.

4. THE CONDUIT AND SERVICE CABLE SHALL EXTEND FROM THE CABINET TO THE UTILITY JUNCTION BOX.

5. CONDUIT AND CONDUCTOR SIZE SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

6. RIGID METAL RISER CONDUIT AND SERVICE CABLE SIZE SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS, OR AS SPECIFIED BY THE LOCAL POWER COMPANY.

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NOTES:

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2. THIS STANDARD IS APPLICABLE FOR ALL ELECTRICAL SERVICES OTHER THAN 480Y/277.

3. FOR ROADWAY LIGHTING SYSTEMS, ONLY SAFETY SWITCH SHALL BE USED.

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8. RIGID MINIMUM 1" NIPPLE, THREADED AT BOTH ENDS, HELD IN PLACE WITH BONDING BUSHING AND LOCK NUT. ADDITIONAL 2" LAG SCREWS TO BE USED TO Secure SAFETY SWITCH/BreakER BOX AND METER BASE TO WOOD POST. FOUR SCREWS TO BE USED WITH EACH.

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NOTES:
1. LOCAL POWER UTILITY COMPANY WILL INSTALL SERVICE CABLE FROM THEIR POWER SOURCE TO THE TOP OF THE OVERHEAD SERVICE POLE (FOR TYPE A OVERHEAD SERVICE) OR THE JUNCTION BOX (FOR TYPE B UNDERGROUND SERVICE) AND MAKE REQUIRED SPLICES TO THE CABLES PROVIDED.
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NOTES:

1. Local power utility company will install service cable from their power source to the current transformer cabinet and meter base then make required splices to the cables provided.

2. This standard is applicable for 480Y/277 electrical service only.

3. All electrical connections and splices shall be tested for electrical continuity.

4. Conduit and conductor size shall be as specified in the contract documents.

5. Rigid metal riser conduit and service cable size shall be as specified in the contract documents, or as specified by the local power company.

6. Safety switch, meter base, wireway, current transformer cabinet and control center shall be attached to the channeling with 3/8" galvanized bolts, lock washers and nuts. Four cross channels shall be utilized.

7. Minimum 2" metal conduit shall be stubbed out 6" past concrete foundation pad. Location of the stubbed conduit shall be as required by the local power company.

8. The contractor shall leave a sufficient amount of conductor cable coiled inside the current transformer cabinet to permit the local power company to make their connection.

9. Service entrance foundation, including the concrete pad, is included in the SE-9 pay item.

SECTION A-A
SERVICE ENTRANCE FOUNDATION DETAIL

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.
NOTES:
1. LOCAL POWER UTILITY COMPANY WILL INSTALL SERVICE CABLE FROM THEIR POWER SOURCE TO THE CURRENT TRANSFORMER CABINET AND METER BASE THEN MAKE REQUIRED SPLICES TO THE CABLES PROVIDED.
2. THIS STANDARD IS APPLICABLE FOR 480Y/277 ELECTRICAL SERVICE ONLY.
3. ALL ELECTRICAL CONNECTIONS AND SPLICES SHALL BE TESTED FOR ELECTRICAL CONTINUITY.
4. CONDUIT AND CONDUCTOR SIZE SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.
5. RIGID METAL RISER CONDUIT AND SERVICE CABLE SIZE SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS, OR AS SPECIFIED BY THE LOCAL POWER COMPANY.
6. SAFETY SWITCH, METER BASE, WIREWAY, CURRENT TRANSFORMER CABINET AND CONTROL CENTER SHALL BE ATTACHED TO THE CHANNELING WITH 3/8" GALVANIZED BOLTS, LOCK WASHERS AND NUTS. FOUR CROSS CHANNELS SHALL BE UTILIZED.
7. MINIMUM 2" METAL CONDUIT SHALL BE STUBBED OUT 6" PAST CONCRETE FOUNDATION PAD LOCATION OF THE STUBBED CONDUIT SHALL BE AS REQUIRED BY THE LOCAL POWER COMPANY.
8. THE CONTRACTOR SHALL LEAVE A SUFFICIENT AMOUNT OF CONDUCTOR CABLE COILED INSIDE THE CURRENT TRANSFORMER CABINET TO PERMIT THE LOCAL POWER COMPANY TO MAKE THEIR CONNECTION.
9. SERVICE ENTRANCE FOUNDATION, INCLUDING THE CONCRETE PAD, IS INCLUDED IN THE SE-9 PAY ITEM.

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NOTES:

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3. THIS STANDARD IS APPLICABLE FOR ALL ELECTRICAL SERVICES OTHER THAN 480Y/277.

4. FOR ROADWAY LIGHTING SYSTEMS, ONLY SAFETY SWITCH SHALL BE USED.

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ELECTRICAL SERVICE
INSTALLATION DETAILS
VIRGINIA DEPARTMENT OF TRANSPORTATION
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ELECTRICAL SERVICE INSTALLATION DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION
CCW-1

CONTROL CENTER WIRING
DETAILS

NOTES:

ALL CIRCUIT BREAKERS SHALL BE SINGLE POLE.

VOLTAGE AND AMPERAGE RATINGS OF CONTACTORS AND BREAKERS SHALL BE AS INDICATED ON THE PLANS.

NUMBER OF CIRCUITS SHOWN ARE TYPICAL. EXACT NUMBER REQUIRED SHALL BE AS INDICATED ON THE PLANS.

* CONTACTORS SHALL BE 2 POLES FOR SINGLE PHASE AND 3 POLES FOR THREE PHASE SERVICES. NUMBER OF CONTACTORS SHALL BE AS REQUIRED TO HANDLE THE NUMBER OF CIRCUITS ACTUALLY BEING UTILIZED.

ROAD AND BRIDGE STANDARDS

EUROPEAN UNION / 2018

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

1314.10

1 OF 4

REVISED DATE

700

705
NOTES:

ALL CIRCUIT BREAKERS SHALL BE SINGLE POLE.

VOLTAGE AND AMPERAGE RATINGS OF CONTACTORS AND BREAKERS SHALL BE AS INDICATED ON THE PLANS.

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AND BREAKERS SHALL BE AS INDICATED ON PLANS.
NUMBER OF CIRCUITS SHOWN ARE TYPICAL, EXACT
NUMBER REQUIRED SHALL BE AS INDICATED ON THE PLANS.

* CONTACTOR SHALL BE 2 POLES FOR SINGLE
PHASE AND 3 POLES FOR THREE PHASE SERVICES.
NUMBER OF CONTACTORS SHALL BE AS REQUIRED TO
HANDLE THE NUMBER OF CIRCUITS ACTUALLY BEING UTILIZED.

CONTROL CENTER WIRING
DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION
NOTES:

ALL CIRCUIT BREAKERS SHALL BE SINGLE POLE.
VOLTAGE AND AMPERAGE RATING OF CONTACTORS
AND BREAKERS SHALL BE AS INDICATED ON THE PLANS.
NUMBER OF CIRCUITS SHOWN ARE TYPICAL, EXACT
NUMBER REQUIRED SHALL BE AS INDICATED ON THE PLANS.
* CONTACTORS SHALL BE 2 POLES FOR SINGLE
PHASE AND 3 POLES FOR THREE PHASE SERVICES.
NUMBER OF CONTACTORS SHALL BE AS REQUIRED TO
HANDLE THE NUMBER OF CIRCUITS ACTUALLY BEING UTILIZED.

CONTROL CENTER WIRING
DETAILS
VIRGINIA DEPARTMENT OF TRANSPORTATION
NOTES:

1. SAW SLOT SHALL BE 5/8" WHEN LOOP DETECTOR CABLE ENCLOSED IN TUBING IS INSTALLED.

   IN NEW ASPHALT CONCRETE ROADWAYS, SAW SLOTS SHALL BE CUT INTO THE BASE COURSE TO A DEPTH OF 3".

   IN EXISTING ASPHALT CONCRETE ROADWAYS WHICH ARE TO BE RESURFACED AS PART OF THE PROJECT, SAW SLOTS SHALL BE CUT INTO THE PLANED SURFACE TO A DEPTH OF 3" PRIOR TO THE OVERLAY. LOOP DETECTORS MAY BE INSTALLED THROUGH FINISHED RIDING SURFACE AS SPECIFIED IN CONTRACT DOCUMENTS. SAW SLOTS IN FINAL RIDING SURFACE SHALL HAVE A 4" MINIMUM AND 4.5" MAXIMUM DEPTH.

2. LOOP SLOTS IN EXISTING ASPHALT CONCRETE ROADWAYS WHICH ARE NOT TO BE RESURFACED AS PART OF THE PROJECT, SAW SLOTS SHALL BE CUT INTO THE EXISTING SURFACE TO A DEPTH OF 4".

   IN EXISTING ASPHALT CONCRETE ROADWAYS WHICH ARE NOT TO BE RESURFACED AS PART OF THE PROJECT, SAW SLOTS SHALL BE CUT INTO THE PLANED SURFACE TO A DEPTH OF 3" PRIOR TO THE OVERLAY. LOOP DETECTORS MAY BE INSTALLED THROUGH FINISHED RIDING SURFACE AS SPECIFIED IN CONTRACT DOCUMENTS. SAW SLOTS IN FINAL RIDING SURFACE SHALL HAVE A 4" MINIMUM AND 4.5" MAXIMUM DEPTH.

   IN EXISTING ASPHALT CONCRETE ROADWAYS WHICH ARE TO BE RESURFACED AS PART OF THE PROJECT, SAW SLOTS SHALL BE CUT INTO THE BASE COURSE TO A DEPTH OF 3".

   LOOP SLOTS IN NEW ASPHALT CONCRETE ROADWAYS SHALL BE CUT INTO THE BASE COURSE TO A DEPTH OF 3".

   LOOP SLOTS IN EXISTING ASPHALT CONCRETE ROADWAYS WHICH ARE NOT TO BE RESURFACED SHALL BE CUT INTO THE PLANED SURFACE TO A DEPTH OF 4".

   LOOP SLOTS IN EXISTING ASPHALT CONCRETE ROADWAYS WHICH ARE TO BE RESURFACED SHALL BE CUT INTO THE PLANED SURFACE TO A DEPTH OF 4.5".

   LOOP SLOTS IN NEW ASPHALT CONCRETE ROADWAYS SHALL BE CUT INTO THE BASE COURSE TO A DEPTH OF 3".

   LOOP SLOTS IN EXISTING ASPHALT CONCRETE ROADWAYS WHICH ARE NOT TO BE RESURFACED SHALL BE CUT INTO THE PLANED SURFACE TO A DEPTH OF 4".

   LOOP SLOTS IN EXISTING ASPHALT CONCRETE ROADWAYS WHICH ARE TO BE RESURFACED SHALL BE CUT INTO THE PLANED SURFACE TO A DEPTH OF 4.5".

   LOOP SLOTS IN NEW ASPHALT CONCRETE ROADWAYS SHALL BE CUT INTO THE BASE COURSE TO A DEPTH OF 3".

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   LOOP SLOTS IN EXISTING ASPHALT CONCRETE ROADWAYS WHICH ARE TO BE RESURFACED SHALL BE CUT INTO THE PLANED SURFACE TO A DEPTH OF 4.5".

   LOOP SLOTS IN NEW ASPHALT CONCRETE ROADWAYS SHALL BE CUT INTO THE BASE COURSE TO A DEPTH OF 3".

   LOOP SLOTS IN EXISTING ASPHALT CONCRETE ROADWAYS WHICH ARE NOT TO BE RESURFACED SHALL BE CUT INTO THE PLANED SURFACE TO A DEPTH OF 4".

   LOOP SLOTS IN EXISTING ASPHALT CONCRETE ROADWAYS WHICH ARE TO BE RESURFACED SHALL BE CUT INTO THE PLANED SURFACE TO A DEPTH OF 4.5".
SHOULDER SECTION

See Note 1

EDGE OF SHOULDER

12"

DRILL THROUGH PAVEMENT

SHOULDER PAVEMENT

TO JUNCTION BOX

1" METAL OR PVC CONDUIT

12"

SAW SLOT

LOOP CABLE

CURB AND GUTTER SECTION

See Note 1

EDGE OF GUTTER

12"

DRILL THROUGH PAVEMENT

1" METAL OR PVC CONDUIT

TO JUNCTION BOX

12"

SAW SLOT

LOOP CABLE

HYDRAULIC CEMENT OR ASPHALT CONCRETE PAVEMENT

CURB SECTION (NO GUTTER)

See Note 1

EDGE OF CURB

12"

DRILL THROUGH PAVEMENT

1" METAL OR PVC CONDUIT

TO JUNCTION BOX

12"

SAW SLOT

LOOP CABLE

ASPHALT CONCRETE OR HYDRAULIC CEMENT CONCRETE PAVEMENT

NOTES:

1. The top of 1" conduits shall be installed 12" below the bottom of the saw slot.

2. Plastic bushings shall be installed on the ends of the conduits in the pavement. Duct seal shall be applied to the open end of the bushing.

3. Saw slots shall intersect with the holes drilled for installation of the conduits and loop cables.

4. Drilled holes shall be no larger than required for installation of the conduit and plastic bushing.

5. Removal of large sections of pavement to perform this work will not be allowed.

6. One conduit shall be provided for each saw slot.

7. All dimensions not shown shall be as specified on the contract documents.
NOTES:

1. ALL DIMENSIONS NOT SHOWN SHALL BE AS SPECIFIED ON THE CONTRACT DOCUMENTS.

2. LOOP WIRE TWISTED TOGETHER WITH A MINIMUM OF THREE TURNS PER RUNNING FOOT.

3. BASED ON THE LENGTH OF LEAD-IN CABLE, ADDITIONAL WIRE TURNS PER LOOP MAY BE REQUIRED AS SPECIFIED BY THE CONTRACT DOCUMENTS.

SEE NOTES 2, 3
ATTACH TO FRAME
(Do not attach to the frame bolt hole)

GROUNDING CONDUCTOR
J-HOOK WIRE SUPPORT 6" BELOW TOP ON ALL WALLS

CONCRETE COLLAR
CLASS A3

#4 BARS Ø 12" C-C

CONDUIT ENTRANCE

GROUNDING ELECTRODE
#6B, #7B, OR #8 AGGREGATE
12" SQ. X 24" DEPTH

NOTES:

J-HOOK WIRE SUPPORTS SHALL BE SECURELY ATTACHED TO THE JUNCTION BOX WITH A BOLT AND NUT WITH A NEOPRENE WASHER OR AN EXPANSION FITTING.

CONDUIT ENTRANCES SHALL BE LOCATED AS SHOWN ON THE PLANS. CONDUITS SHALL EXTEND 2" MIN. TO 3" MAX. INTO THE INSIDE WALL OF THE JUNCTION BOX.

BELL ENDS SHALL BE INSTALLED ON THE ENDS OF PVC CONDUTS. GROUNDING BUSHINGS SHALL BE INSTALLED ON THE ENDS OF METAL CONDUTS.

CONDUTS AND BUSHINGS SHALL BE PLUGGED TO PREVENT MOISTURE & RODENT ENTRY.

* DEPTH OF CONDUIT ENTRANCES FOR MAGNETIC DETECTORS SHALL BE IN ACCORDANCE WITH THE PLANS.

ALL REINFORCING STEEL SHALL HAVE A MINIMUM 1 1/2" CONCRETE COVER. ANY REINFORCING STEEL IN CONFLICT WITH CONDUIT SHALL BE CUT A MINIMUM OF 1 1/2" FROM CONDUIT.

THE JUNCTION BOX MAY BE PRECAST OR CAST IN PLACE CONCRETE.

* A MINIMUM 2" DIAMETER CONDUIT ENTRANCE IS REQUIRED UNLESS OTHERWISE SPECIFIED ON PLANS.

A CONCRETE COLLAR IS REQUIRED ONLY WHEN JUNCTION BOX IS INSTALLED IN EARTH AREAS.

HIGH STRENGTH GROUT CONFORMING TO THE ROAD & BRIDGE SPECIFICATIONS SHALL BE USED TO SECURE THE FRAME TO THE JUNCTION BOX.

ALL JUNCTION BOXES SHALL BE INSTALLED WITH A GROUNDING ELECTRODE.

VOIDS RESULTING FROM ENTRANCE OF CONDUTS INTO JUNCTION BOX SHALL BE COMPLETELY FILLED WITH HYDRAULIC CEMENT GROUT CONFORMING TO THE ROAD & BRIDGE SPECIFICATIONS.
**JUNCTION BOX**

**FOR TRAFFIC USE**

**VIRGINIA DEPARTMENT OF TRANSPORTATION**

**NOTES:**

THE COVER SHALL HAVE A NON-SKID SURFACE WITH LETTERS CAST IN THE DEPRESSION ON TOP. THE LETTERS "VDOT ELEC", "VDOT TRAFF", "VDOT COMM" OR "UTILITY" AS APPLICABLE ARE TO BE ONE (1) INCH WIDE AND RAISED 1/8" HIGH. COVERS USED FOR JUNCTION BOXES INSTALLED WITHIN MUNICIPALITIES AND NOT MAINTAINED BY VDOT SHALL NOT REQUIRE THE VDOT REFERENCE.

FOUR RECESSED 3/8" HEX BOLTS ARE REQUIRED FOR EACH COVER.

CASTINGS SHALL MEET ALL REQUIREMENTS OF AASHTO M305 AND AASHTO M405

---

**SIDE VIEW**

**DETAIL A**

RING OR HANDLE RECEDED LIFT

1/4" NEOPRENE GASKET GLUED TO FRAME

**DETAIL B**

1 3/16" S.S.

3 1/8" S.S.

**PICKBAR DETAIL**

3/4" NEOPRENE GASKET PERMANENTLY ATTACHED TO FRAME.

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**STANDARD**

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<th>STANDARD</th>
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<th>C</th>
<th>D</th>
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<th>F</th>
<th>G</th>
<th>H</th>
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<th>J</th>
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Junction boxes may be straight or flared wall in design. Materials shall conform to Section 238 of the Road & Bridge Specifications.

Bell ends shall be installed on the ends of PVC conduits.

Grounding bushings shall be installed on the ends of metal conduits.

Bell ends and bushings shall be plugged to prevent moisture and rodent entry.

Depth of conduit entrance for use of magnetic detectors shall be in accordance with Standard TD-2.

Conduit entrances shall be located as shown on the plans.

The cover shall have a non-skid surface with letters cast in the depression on top. The letters "VDOT ELEC", "VDOT TRAF", "VDOT COMA" or utility as applicable are to be in 1" wide covers used for junction boxes installed within municipalities and not maintained by VDOT shall not require the VDOT reference.

All junction boxes shall be installed with a grounding electrode.

Two recessed 3/4" S.S. hex head bolts are required for each cover.

A minimum 2" diameter conduit entrance is required, unless otherwise specified on the plans.

J-hook wire supports shall be securely attached to the junction box with a bolt and nut with a neoprene washer or an expansion fitting. Conduits shall extend 2" to 3" max. into the inside wall of the junction box.

The junction box may be a two piece design with the top section no less than 17" in depth.

Voids resulting from entrance of conduits into junction boxes shall be completely filled with an approved material.
NOTES:

1. CONTRACTOR SHALL INSTALL A 4" MINIMUM TO 6"
   MAXIMUM WIDE RED PLASTIC LOCATOR TAPE 6" TO 8"
   BELOW FINISHED GRADE AND DIRECTLY ABOVE BURIED
   CONDUIT OR CONDUCTOR CABLES.

2. CONDUIT INSTALLED UNDER EXISTING OR PROPOSED
   ROADS/WAYS OR SIDEWALK FOR DIRECT BURIED CABLES
   SHALL EXTEND 24" BEYOND THE PAVED SURFACE AND/OR
   SIDEWALK.

3. WHERE CONDUIT FOR POWER AND CONDUIT FOR
   COMMUNICATION ARE TO BE INSTALLED IN CLOSE
   PROXIMITY TO EACH OTHER, CONDUITS SHALL BE PLACED
   PARALLEL IN A COMMON TRENCH WITH NO LESS THAN 6"
   OF SEPARATION BETWEEN CONDUIT SYSTEMS.

4. BACKFILL MATERIAL BELOW THIS LEVEL SHALL BE SANDY
   FILL (FREE OF ANY STONES, CINDERS, WOOD, ROOTS,
   DEBRIS, ETC.).

5. ONE OR MORE CONDUITS AS REQUIRED.

6. ONE OR MORE CONDUCTOR CABLES AS REQUIRED.

7. OFFSETTING OF CONDUIT MAY BE USED FOR TYING INTO
   EXISTING CONDUIT SYSTEMS OR BYPASSING OBSTRUCTIONS
   AS DIRECTED BY THE ENGINEER.

8. WHEN OFFSETTING CONDUIT TO BYPASS AN OBSTRUCTION,
   THE CONDUIT SHALL MAINTAIN A MINIMUM CLEARANCE OF
   12" FROM THE CLOSEST POINT OF THE OBSTRUCTION.
PROCEDURE FOR USING TABLES FOR STANDARDS WSP-1 AND STP-1:

1. SELECT MINIMUM MOUNTING HEIGHT TO BE USED (5'-0" OR 7'-0").

2. DECIDE ON NUMBER OF POSTS TO BE USED (SINGLE, TWO OR THREE).

3. CALCULATE THE AREA OF EACH SIGN PANEL \( A_1, A_2, A_3, \ldots, A_n \).

4. CALCULATE THE CENTROIDAL DISTANCE FOR EACH SIGN PANEL \( (H_1, H_2, H_3 \ldots H_n) \).

   THE CENTROIDAL DISTANCE IS THE VERTICAL DISTANCE FROM THE REFERENCE POINT ON THE GROUND LINE TO THE CENTER OF EACH SIGN PANEL.

5. CALCULATE THE CENTROIDAL DISTANCE \( H \) FOR THE ENTIRE SIGN PANEL GROUP:

\[
H = \frac{(A_1 \times H_1 + A_2 \times H_2 + A_3 \times H_3 + \ldots A_n \times H_n)}{(A_1 + A_2 + A_3 + \ldots A_n)}
\]

6. ENTER THE APPROPRIATE TABLE BASED ON:

   THE MINIMUM MOUNTING HEIGHT SELECTED IN STEP 1

   PICK THE POST SIZE(S) TO BE REVIEWED, AND ENTERING WITH THE "H" VALUE CALCULATED IN STEP 5, READ THE MAXIMUM AREA UNDER THE SIZE OF POSTS SELECTED IN STEP 3. IF THE TOTAL AREA OF SIGN PANEL(S) TO BE SUPPORTED IS LESS THAN OR EQUAL TO THAT SHOWN IN THE TABLE(S), THE SIZE OF THE POST(S) WILL BE SATISFACTORY.

NOTES:

REFERENCE POINT FOR CALCULATING CENTROIDAL DISTANCE(S):

FOR SINGLE POST: ON GROUND LINE AT INTERSECTION OF POST
FOR TWO-POSTS: ON GROUND LINE, HALF-WAY BETWEEN POSTS
FOR THREE POSTS: ON GROUND LINE AT INTERSECTION OF CENTER POST
GENERAL NOTES:

1. WSP STANDARDS SHALL ONLY BE USED FOR TEMPORARY SIGN INSTALLATIONS THAT WILL BE IN PLACE FOR A MAXIMUM OF 36 MONTHS.

2. FOR ALL SIGNS EXCEPT STREET NAME SIGNS:
   A. MINIMUM MOUNTING HEIGHT (h) SHALL BE 7 FEET FOR TEMPORARY SIGNS AND 6 FEET FOR SECONDARY SIGNS (SEE NOTE 4).
   B. MAXIMUM MOUNTING HEIGHT (h) FOR THE BOTTOM-MOST SIGNS SHALL BE 8 FEET, EXCEPT WHEN NECESSARY TO ACHIEVE MINIMUM VERTICAL CLEARANCE BENEATH SIGN AS PER NOTE 2C.
   C. MINIMUM VERTICAL CLEARANCE (DISTANCE BETWEEN BOTTOM OF SIGN AND FINISHED GRADE BENEATH THE SIGN) SHALL BE 7 FEET FOR ANY PORTION OF THE SIGN WITHIN THE CLEAR ZONE. THIS MINIMUM VERTICAL CLEARANCE MAY BE REDUCED TO 5 FEET FOR EITHER OF THE FOLLOWING CONDITIONS:
      * WHEN SIGNS OR PORTIONS OF SIGNS ARE LOCATED MORE THAN 10 FEET UP A CUT, SLOPE GREATER THAN 3:1,
      * WHEN SIGNS OR PORTIONS OF SIGNS ARE LOCATED MORE THAN 10 FEET UP A CUT, SLOPE GREATER THAN 3:1, OR
      * WHEN THE SIGN IS LOCATED AT LEAST THE MINIMUM DISTANCE BEHIND CURB, BARRIER, OR GUARDRAIL AS PER NOTES 6 AND 7.

3. MOUNTING HEIGHT (h) FOR STREET NAME SIGNS SHALL BE BETWEEN 8'-6" AND 9'-0".

4. A SECONDARY SIGN IS CONSIDERED TO BE A SIGN MOUNTED BELOW ANOTHER SIGN, EXCEPT A ROUTE MARKING ASSEMBLY (CONSISTING OF A ROUTE MARKER WITH AN AUXILIARY PLATE) IS CONSIDERED TO BE A SINGLE SIGN. A SECONDARY SIGN SHALL NOT BE MOUNTED LOWER THAN 7 FEET ABOVE A PEDESTRIAN SIDEWALK OR PATHWAY IF IT WILL PROJECT MORE THAN 4" INTO THE PEDESTRIAN FACILITY.

5. FOR SIGNS LOCATED IN AREAS WHERE PEDESTRIAN MOVEMENTS ARE LIKELY TO OCCUR OR ON-STREET PARKING IS PERMITTED, THE MOUNTING HEIGHT (h) FROM THE LOWEST PORTION OF THE SIGN TO THE FINISHED SURFACE SHALL HAVE A CLEARANCE OF 7 FEET.

6. THE LATERAL CLEARANCE TO THE SIGN EDGE SHALL BE A MINIMUM OF 2 FEET FROM THE FACE OF CURB OR 4 FEET FROM FACE OF PERMANENT CONCRETE BARRIER, IF PRESENT. THE EDGE OF SIGN SHALL BE OUTSIDE THE DEFLECTION ZONE FOR TRAFFIC BARRIER SERVICE.

7. UNLESS OTHERWISE APPROVED BY THE ENGINEER, SIGNS PLACED BEHIND GUARDRAIL SHALL BE LOCATED SUCH THAT THE NEAR SIDE EDGE OF THE SIGN PANEL IS OUTSIDE OF THE GUARDRAIL DEFLECTION DISTANCE.

8. THE TOP OF THE SIGN POST MAY EXTEND NO MORE THAN 2 FEET ABOVE THE TOP OF THE SIGN.

9. THE SIGN POST SHALL BE PLUMB AT INSTALLATION AND SHALL NOT LEAN OR TWIST DURING USE. IN THE EVENT THE POST LEANS OR TWISTS OUT OF POSITION THE CONTRACTOR SHALL TAKE IMMEDIATE CORRECTIVE ACTION.

10. ED-3 TYPE 2 DELINEATORS SHALL BE PLACED ON ALL POSTS DURING ALL TIMES THAT THE SIGN IS COVERED. THE COLOR OF THE ED-3 DELINEATORS SHALL MATCH THE COLOR OF THE ADJACENT EDGE LINE MARKING.

WOOD POST NOTES:

11. MINIMUM SPACING (CENTER TO CENTER) BETWEEN TWO 4" x 4" WOOD POSTS SHALL BE 3 FEET. MINIMUM SPACING (CENTER TO CENTER) BETWEEN TWO WOOD POSTS OF ANY OTHER SIZE SHALL BE 8 FEET.

SQUARE TUBE POST NOTES:

12. W = (0.60) X (SIGN WIDTH)
**INSTALLATION DETAILS**

**SIDE VIEW**

- Wood post
- Ground line
- 80 lbs of cementitious material shall be mixed with the excavated material and then backfilled in 6" lifts with tamping.
- 1'-0"

**FRONT VIEW**

- Wood post
- Sign face
- Bottom of sign
- Ground line
- Wood post
- SLOPE BORE HOLES AT APPROX. 1/2"/12" FOR DRAINAGE.

**NOTE:**

- 6" X 6" Wood post requires two 2" bore holes.
- 6" X 8" Wood post requires two 3" bore holes.
- Posts less than 6" X 6" do not require bore holes.

**METHOD OF POST DRILLING**

**SIDE VIEW**

- Wood post
- Ground line
- 3' MIN. FOR 4"x4" POST. 4' MIN. FOR ALL OTHER POSTS.

**NOTES:**

- 1. 6" X 6" Wood post requires two 2" bore holes.
- 2. 6" X 8" Wood post requires two 3" bore holes.
- 3. Posts less than 6" X 6" do not require bore holes.

**CONCRETE**

- Wood post
- Standard bituminous surface course
- Backfill material to be tamped, no concrete used.

**SET IN CONCRETE**

- 3' MIN. FOR 4"x4" POST. 4' MIN. FOR ALL OTHER POSTS.

**SET IN EARTH**

- Wood post
- Concrete
- Standard bituminous surface course
- Excavated material mixed with the material shall be cementitious.

**NOTES:**

- 1. 6" X 6" Wood post requires two 2" bore holes.
- 2. 6" X 8" Wood post requires two 3" bore holes.
- 3. Posts less than 6" X 6" do not require bore holes.

**BRACING AND POST TOLERANCE DETAIL**

**NOTES:**

- 1. Sign widths greater than 48" shall require sign bracing conforming to standard STP-1.
- 2. The top of post shall be no more than 2" below and no more than 2 feet above the top of the sign.

**WOOD OR SQUARE TUBE POST**

- See note 2

**SEE NOTE 2**

- \( \frac{1}{2}'' \) TO 2"

**REFERENCE SPECIFICATION**

- WSP-1

**TEMPORARY SIGNS**

(WOOD OR SQUARE TUBE STEEL POST SIGN STRUCTURES)

Virginia Department of Transportation

**REVISION DATE**

02/16

**ROAD AND BRIDGE STANDARDS**

1320.11

**A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.**
## DESIGN TABLE FOR WOOD POST

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### NOTES:

1. FOR A SINGLE 4" X 4" POST THE MAXIMUM TOTAL SIGN CAN BE INCREASED TO 16 SQUARE FEET PROVIDED:

   - **A.** THE MAXIMUM VERTICAL CLEARANCE BETWEEN THE GROUND LEVEL AND BOTTOM OF THE SIGN DOES NOT EXCEED 7'-6" WHILE MAINTAINING A 7'-0" MINIMUM MOUNTING HEIGHT (H) BETWEEN BOTTOM OF SIGN AND TOP OF ROADWAY SURFACE AT THE EDGE OF TRAVEL LANE.
   - **B.** CONTRACTOR SUPPLIES DEPARTMENT WITH MATERIALS CERTIFICATION FOR WOOD POSTS TO ENSURE CONFORMANCE WITH SECTION 236 OF THE SPECIFICATIONS.

2. LARGER DIMENSION OF WOOD POST SHALL BE IN DIRECTION OF (PARALLEL TO) TRAFFIC.

3. CENTROID SHALL BE DETERMINED IN ACCORDANCE WITH STANDARD PCS-1.
NOTES:

1. NYLON WASHER SHALL BE \( \frac{1}{8} \)" THICK MINIMUM WITH AN OUTSIDE DIAMETER OF \( \frac{3}{4} \)" AND AN INSIDE DIAMETER OF \( \frac{1}{2} \)".

2. DRIVE RIVET SHALL BE \( \frac{3}{16} \)" OR \( \frac{1}{8} \)" ALUMINUM FLAT HEAD RIVET WITH NYLON OR RUBBER WASHER.

3. SIGN PANEL ATTACHMENTS TO SQUARE TUBE POSTS SHALL BE AS PER STANDARD STP-1.

4. THE HEADS OF ALL DRIVE RIVETS AND BOLTS PROTRUDING FROM TEMPORARY SIGNS MAY BE UNCOATED. IF POWDER COATED, THE HEADS SHALL MATCH THE COLOR OF THE SIGN SHEETING.

5. BOLTS, NUTS, AND LOCK WASHERS SHALL BE GALVANIZED OR STAINLESS STEEL.
## Design Table for Square Tube Post

<table>
<thead>
<tr>
<th>Size of Post</th>
<th>Centroid (ft)</th>
<th>Maximum Area (Total of Signs) (ft²)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Single-Post</td>
<td>Two-Post</td>
</tr>
<tr>
<td>2 Inch 14 GA.</td>
<td>8</td>
<td>10.7</td>
<td>21.4</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>9.5</td>
<td>19.0</td>
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<tr>
<td></td>
<td>10</td>
<td>8.5</td>
<td>17.0</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>7.7</td>
<td>15.4</td>
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<td>12</td>
<td>7.1</td>
<td>14.2</td>
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<td>13.0</td>
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<tr>
<td></td>
<td>14</td>
<td>6.1</td>
<td>12.2</td>
</tr>
<tr>
<td>2 ½ Inch 12 GA.</td>
<td>8</td>
<td>21.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>19.1</td>
<td></td>
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<td>10</td>
<td>17.2</td>
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<td>11</td>
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<td>14.3</td>
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</tr>
<tr>
<td></td>
<td>14</td>
<td>12.3</td>
<td></td>
</tr>
<tr>
<td>2 ½ Inch 10 GA.</td>
<td>8</td>
<td>24.8</td>
<td>49.6</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>22.0</td>
<td>44.0</td>
</tr>
<tr>
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<td>10</td>
<td>19.8</td>
<td>39.6</td>
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<td>11</td>
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<td></td>
<td>12</td>
<td>16.5</td>
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<td>13</td>
<td>15.2</td>
<td>30.4</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>14.1</td>
<td>28.2</td>
</tr>
<tr>
<td>2 ½ Inch 10 GA. WITH 2 ½ Inch 10 GA. INNER POST (SEE NOTE 1)</td>
<td>8</td>
<td>43.4</td>
<td>86.8</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>38.6</td>
<td>77.2</td>
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<td>63.2</td>
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<td>12</td>
<td>28.9</td>
<td>57.8</td>
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<td>13</td>
<td>26.7</td>
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<tr>
<td></td>
<td>14</td>
<td>24.8</td>
<td>49.6</td>
</tr>
</tbody>
</table>

### NOTES:
1. THE INNER POST SHALL BE 6 FEET IN LENGTH.
2. CENTROID SHALL BE DETERMINED IN ACCORDANCE WITH PCS-1.
3. MINIMUM COLD FORMED YIELD STRENGTH SHALL BE: 14 GA AND 12 GA = 60 KSI 10 GA = 55 KSI
4. TYPE A, B, C, D, E, AND F FOUNDATIONS SHALL BE IN ACCORDANCE WITH STANDARD STP-1.
SPLICE DETAIL

<table>
<thead>
<tr>
<th>SPLICE SIZE TABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>POST SIZE</td>
</tr>
<tr>
<td>2 INCH, 14 GAUGE</td>
</tr>
<tr>
<td>2½ INCH, 12 GAUGE</td>
</tr>
<tr>
<td>2½ INCH, 10 GAUGE</td>
</tr>
</tbody>
</table>

NOTES:
1. ONLY ONE SPLICE PER POST WILL BE ALLOWED.
2. SPLICES SHALL BE A MINIMUM OF 24" ABOVE GROUND LINE.
3. SPLICES SHALL ONLY BE PERMITTED FOR TEMPORARY INSTALLATIONS.
4. CORNER BOLTS SHALL BE INSTALLED SO THE BOLT HEADS ALTERNATE SIDES PER EACH CORNER BOLT. THE BOLT HEAD SHALL BE ON THE LEFT OR RIGHT SIDE OF THE POST. THE NUT SHALL BE ON THE BACK OF THE POST. SEE SPLICE DETAIL.

SIGN

TEMPORARY SIGNS
(FOR CONSTRUCTION, MAINTENANCE, PERMIT AND UTILITY ACTIVITIES)
SQUARE TUBE POST SIGN STRUCTURES
VIRGINIA DEPARTMENT OF TRANSPORTATION
NOTES:

1. FOR ALL SIGNS EXCEPT STREET NAME SIGNS:
   A. MINIMUM MOUNTING HEIGHT (h) SHALL BE IN ACCORDANCE WITH THE "MINIMUM MOUNTING HEIGHT" TABLE ON THIS SHEET.
   B. MAXIMUM MOUNTING HEIGHT (h) FOR THE BOTTOM-MOST SIGN PANEL(S) SHALL BE 8 FEET, EXCEPT WHEN NECESSARY TO ACHIEVE MINIMUM VERTICAL CLEARANCE BELOW THE PANEL AS PER NOTE IC.
   C. MINIMUM VERTICAL CLEARANCE (DISTANCE BETWEEN BOTTOM OF SIGN PANEL AND FINISHED GRADE BENEATH THE PANEL) SHALL BE 7 FEET FOR ANY PORTION OF THE SIGN WITHIN THE CLEAR ZONE. THIS MINIMUM VERTICAL CLEARANCE MAY BE REDUCED TO 5 FEET FOR EITHER OF THE FOLLOWING CONDITIONS:
      * WHEN SIGNS OR PORTIONS OF SIGNS ARE LOCATED MORE THAN 10 FEET UP A CUT SLOPE GREATER THAN 3:1, OR
      * WHEN THE SIGN IS LOCATED AT LEAST THE MINIMUM DISTANCE BEHIND CURB, BARRIER, OR GUARDRAIL AS PER NOTES 7 AND 8.

2. MOUNTING HEIGHT (h) FOR STREET NAME SIGNS SHALL BE BETWEEN 8'-6" AND 9'-0".

3. A SECONDARY SIGN IS CONSIDERED TO BE A SIGN MOUNTED BELOW ANOTHER SIGN, EXCEPT A ROUTE MARKER WITH AN AUXILIARY PLATE IS CONSIDERED TO BE A SINGLE SIGN. A SECONDARY SIGN SHALL NOT BE MOUNTED LOWER THAN 7 FEET ABOVE A PEDESTRIAN SIDEWALK OR PATHWAY IF IT WILL PROJECT INTO THE PEDESTRIAN FACILITY.

4. W = (0.60) X (SIGN PANEL WIDTH)

5. SQUARE TUBE SIGN POSTS REQUIRING A BREAKAWAY SUPPORT SYSTEM SHALL BE AN FHWA APPROVED BREAKAWAY SUPPORT SYSTEM CONFORMING TO AASHTO'S STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS.

6. FOR SIGNS LOCATED IN AREAS WHERE PEDESTRIAN MOVEMENTS ARE LIKELY TO OCCUR OR ON-STREET PARKING IS PERMITTED, THE HEIGHT FROM THE LOWEST PORTION OF THE SIGN PANEL TO THE FINISHED SURFACE SHALL HAVE A MINIMUM CLEARANCE OF 7 FEET.

7. THE LATERAL CLEARANCE TO THE SIGN PANEL SHALL BE A MINIMUM OF 2 FEET FROM THE FACE OF CURB OR 4 FEET FROM FACE OF BARRIER, IF PRESENT.

8. UNLESS OTHERWISE APPROVED BY THE ENGINEER, SIGNS PLACED BEHIND GUARDRAIL SHALL BE LOCATED SUCH THAT THE NEAR SIDE EDGE OF THE SIGN PANEL IS OUTSIDE OF THE GUARDRAIL DEFLECTION DISTANCE.

MINIMUM MOUNTING HEIGHT (h)

<table>
<thead>
<tr>
<th>SIGN TYPES</th>
<th>FREEWAYS, EXPRESSWAYS, AND FULL CONTROL ACCESS HIGHWAYS</th>
<th>OTHER HIGHWAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RURAL AREAS</td>
<td>NON-RURAL AREAS</td>
</tr>
<tr>
<td>DIRECTIONAL SIGNS</td>
<td>7'</td>
<td>5'</td>
</tr>
<tr>
<td>ROUTE MARKERS, WARNING AND REGULATORY SIGNS</td>
<td>7'</td>
<td>5'</td>
</tr>
<tr>
<td>SECONDARY SIGNS (SEE NOTE 3)</td>
<td>5'</td>
<td>4'</td>
</tr>
</tbody>
</table>

SPECIFICATION REFERENCE

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

SQUARE TUBE SIGN POST

VIRGINIA DEPARTMENT OF TRANSPORTATION
# Table 1
FOR HAMPTON ROADS DISTRICT (SEE NOTE 5)

<table>
<thead>
<tr>
<th>SIZE OF POST</th>
<th>CENTROID (FT)</th>
<th>MAXIMUM AREA (TOTAL OF SIGN PANELS) (FT²)</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SINGLE-POST</td>
<td>TWO-POST</td>
</tr>
<tr>
<td>2 INCH 14 GA.</td>
<td>8</td>
<td>5.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>5.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>4.6</td>
<td></td>
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<tr>
<td></td>
<td>11</td>
<td>4.2</td>
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<td>12</td>
<td>3.8</td>
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<td>13</td>
<td>3.5</td>
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<tr>
<td></td>
<td>14</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>2 1/2 INCH 12 GA.</td>
<td>8</td>
<td>11.8</td>
<td>23.6</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>10.5</td>
<td>21.0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>9.4</td>
<td>18.8</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>8.6</td>
<td>17.2</td>
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<tr>
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<td>12</td>
<td>7.8</td>
<td>15.6</td>
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<tr>
<td></td>
<td>13</td>
<td>7.2</td>
<td>14.5</td>
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<tr>
<td></td>
<td>14</td>
<td>6.7</td>
<td>13.5</td>
</tr>
<tr>
<td>2 1/2 INCH 10 GA.</td>
<td>8</td>
<td>13.6</td>
<td>27.2</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>12.1</td>
<td>24.2</td>
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<td>16.8</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>7.8</td>
<td>15.6</td>
</tr>
<tr>
<td>2 1/2 INCH 10 GA. WITH 2 3/8 INCH 10 GA. INNER POST (SEE NOTE 11)</td>
<td>8</td>
<td>23.9</td>
<td>47.8</td>
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<tr>
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<td>29.4</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>13.6</td>
<td>27.2</td>
</tr>
</tbody>
</table>

**NOTES:**

1. **THE INNER POST SHALL BE 6 FEET IN LENGTH.**
2. **CENTROID SHALL BE DETERMINED IN ACCORDANCE WITH PCS-1.**
3. **MINIMUM COLD FORMED YIELD STRENGTH SHALL BE:**
   - 14 GA. AND 12 GA. = 60 KSI
   - 10 GA. = 55 KSI
4. **FOLLOW SIGN BRACING DETAILS (SEE SHEET 11 OF 12) FOR MAXIMUM SIGN PANEL WIDTHS AND SIGN BRACING SPACING.**
5. **TABLE 1 SHALL BE USED FOR THE HAMPTON ROADS DISTRICT, EXCEPT THE CITY OF EMPORIA AND COUNTIES OF GREENSVILLE, SUSSEX, AND SOUTHAMPTON SHALL USE TABLE 2.**

---

**ROAD AND BRIDGE STANDARDS**

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

**SQUARE TUBE SIGN POST**

**VIRGINIA DEPARTMENT OF TRANSPORTATION**

**SPECIFICATION REFERENCE**

700
## TABLE 2

FOR BRISTOL, SALEM, LYNCHBURG, RICHMOND, FREDERICKSBURG, CULPEPER, STAUNTON, AND NORTHERN VIRGINIA DISTRICTS (SEE NOTE 5)

<table>
<thead>
<tr>
<th>SIZE OF POST</th>
<th>CENTROID (FT)</th>
<th>MAXIMUM AREA (TOTAL OF SIGN PANELS) (FT²)</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SINGLE-POST</td>
<td>TWO-POST</td>
<td>THREE-POST</td>
</tr>
<tr>
<td>2 INCH 14 GA.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>10.7</td>
<td>21.4</td>
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<tr>
<td>9</td>
<td>9.5</td>
<td>19.0</td>
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<tr>
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<td>6.1</td>
<td>12.2</td>
<td></td>
</tr>
<tr>
<td>2½ INCH 12 GA.</td>
<td></td>
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<tr>
<td>8</td>
<td>21.5</td>
<td></td>
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<td>14</td>
<td>12.3</td>
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<tr>
<td>2½ INCH 10 GA.</td>
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<td>2½ INCH 10 GA. WITH 2½ INCH 10 GA. INNER POST (SEE NOTE 1)</td>
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<td>8</td>
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<td>24.8</td>
<td>49.6</td>
<td>74.4</td>
</tr>
</tbody>
</table>

**NOTES:**

1. THE INNER POST SHALL BE 6 FEET IN LENGTH.
2. CENTROID SHALL BE DETERMINED IN ACCORDANCE WITH PCS-1.
3. MINIMUM COLD FORMED YIELD STRENGTH SHALL BE:
   - 14 GA. AND 12 GA. = 60 KSI
   - 10 GA. = 55 KSI
4. FOLLOW SIGN BRACING DETAILS (SEE SHEET 11 OF 12) FOR MAXIMUM SIGN PANEL WIDTHS AND SIGN BRACING SPACING.
5. TABLE 2 SHALL ALSO BE USED FOR THE CITY OF EMPORIA AND COUNTIES OF GREENSVILLE, SUSSEX, AND SOUTHAMPTON IN HAMPTON ROADS DISTRICT.
FOUNDATION TYPE A DETAILS

ANCHOR SLEEVE BASE DETAIL

CLASS A3 CONCRETE OR A PREAPPROVED BAG MIX FROM THE DEPARTMENTS' APPROVED LIST, NO. 31.

17/32" DIAMETER HOLE, TYPICAL

ANCHOR SLEEVE BASE

2"-14 GAUGE OR 2½"-12 GAUGE SQUARE TUBE POST

3" x 7 GAUGE FOR 2½" SQUARE TUBE POST

FLANGED SHOULDER BOLT WITH SERRATED FLANGE NUT

2½"-16 x 3½" GRADE 8

ANCHOR SLEEVE BASE

1½" x 7 GAUGE FOR 2½" SQUARE TUBE POST

FLANGED SHOULDER BOLT WITH SERRATED FLANGE NUT

3½"-16 x 3½" GRADE 8
SQUARE TUBE SIGN POST

FOUNDATION TYPE B DETAILS

MATERIALS:
- 3" X 3" X 7 GAUGE ASTM A500 GRADE B TUBE
- 1" THICK ASTM A572 GRADE 50 PLATE STEEL
- GALVANIZE PER ASTM A153
- ALL WELDS TO BE 1/8" X 3/8" FILLET TYPE

CLASS A3 CONCRETE OR A PREAPPROVED BAG MIX FROM THE DEPARTMENTS' APPROVED LIST, NO. 31.

DEPARTMENTS' APPROVED LIST, NO. 31.

A PREAPPROVED BAG MIX FROM THE CLASS A3 CONCRETE OR ROAD AND BRIDGE STANDARDS

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.
**MATERIALS:**
GALVANIZED PER ASTM A123
ALL WELDS TO BE \( \frac{3}{16} \)" OR \( \frac{1}{8} \)" FILLET TYPE

**FOUNDATION TYPE C**

**8" TRIANGULAR MULTI-DIRECTIONAL COMBINATION ANCHOR/SLIP BASE PLATE - SOIL**

DIRECT DRIVEN SOIL INSTALLATION.
INSTALL WITH THE WIDEST BEARING SURFACE OF THE STABILIZING WING
PARALLEL WITH THE FACE OF THE SIGN.

1" THICK ASTM A572 GRADE 50 PLATE STEEL

7 GAUGE ASTM A569 PLATE

2" LONG 3/16" STITCH WELDS EQUALLY SPACED

3" X 3" X 7 GAUGE ASTM A500 GRADE B TUBE

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

ROAD AND BRIDGE STANDARDS

SQUARE TUBE SIGN POST

FOUNDATION TYPE C DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE 700
SLIP BASE BREAKAWAY DETAIL

MATERIALS:
- TUBE RECEIVER - 3" x 3" x 7 GAUGE
- ASTM A500
- GRADE B TUBE PLATE - ASTM A572 GRADE 50

NOTES:

TORQUE FREE MATCH PLATE HARDWARE

2 3/8" TUBE RECEIVER
- 2 3/8" - 10 GAUGE OR
- 2 3/8" - 12 GAUGE
- SQUARE TUBE SIGN POST

1/2" - 13 GRADE B SERRATED FLANGE NUT

UPPER SLIP BASE OR CAST IRON SLIP BASE WITH LOCKING WEDGE (SEE DETAILS)

3/8" - 16 GRADE 8 FLANGED SHOULDER BOLT

(SEE NOTE 1)

3/8" - 16 USS FLAT WASHER

HARDENED, TEFLON COATED WASHER SHIM

1 1/4" - 13 LARGE FLANGE NUT

MULTI-DIRECTIONAL COMBINATION ANCHOR/SLIP BASE PLATE (FOUNDATION B) OR
MULTI-DIRECTIONAL COMBINATION ANCHOR/SLIP BASE PLATE - SOIL (FOUNDATION C)

6" FLAT WASHER

1/2" - 13 GRADE B LARGE FLANGE NUT

TOP POST RECEIVER/ FOR 2 1/2" SQUARE POST

5/8" HEX HEAD

9/16" HEX HEAD

1/4" - 13 THREADS

TORQUE FREE BOLT

3/4" HEX HEAD

5/8" HEX HEAD

1/2" - 13 THREADS
NOTES:
1. EXCAVATE TO A DEPTH OF NO LESS THAN 8" AND NO GREATER THAN 12" PRIOR TO INSTALLATION OF DRIVE TUBE FOUNDATION.
2. THE EXCAVATED AREA SHALL BE BACKFILLED WITH A CEMENTITIOUS MATERIAL AND SHALL BE TAPPED WITH EACH 6" LIFT.
3. THE SQUARE TUBE POST SHALL BE INSERTED INTO THE SLEEVE OF THE DRIVE TUBE FOUNDATION A MINIMUM OF 12".
4. DRIVE CAP SHALL BE UTILIZED FOR INSTALLATION OF DRIVE TUBE FOUNDATION WHEN USING A POWER DRIVER, A SHANK SHALL ALSO BE REQUIRED.

DRIVE TUBE FOUNDATION TABLE

<table>
<thead>
<tr>
<th>FOUNDATION TYPE</th>
<th>SIZE OF POST</th>
<th>DRIVE TUBE FOUNDATION DIMENSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE D</td>
<td>2 INCH 14 GA.</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>27&quot;</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>36&quot;</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>2½&quot;</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>2½&quot; x 2½&quot; x 3/8&quot; ASTM A500 GRADE B</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>2½&quot; x 2½&quot; x 3/8&quot; ASTM A36</td>
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<tr>
<td>TYPE E</td>
<td>2½ INCH 12 GA.</td>
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<td>A</td>
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<tr>
<td>B</td>
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</tr>
<tr>
<td>D</td>
<td>3½&quot; x 3½&quot; x 3/8&quot; ASTM A500 GRADE B</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>3½&quot; x 3½&quot; x 3/8&quot; ASTM A36</td>
<td></td>
</tr>
</tbody>
</table>
NOTES:

1. CORNER BOLTS SHALL BE 3/4" DIA. TRUSS HEAD BOLT WITH SERRATED FLANGE NUT. TWO CORNER BOLTS WILL BE REQUIRED TO CONNECT THE 2¼" POST SLEEVE TO THE SOIL STABILIZING PLATE.

2. EXCAVATE TO A DEPTH OF NO LESS THAN 8" AND NO GREATER THAN 12" PRIOR TO INSTALLATION OF SOIL STABILIZING PLATE FOUNDATION.

3. THE EXCAVATED AREA SHALL BE BACKFILLED WITH A CEMENTITIOUS MATERIAL AND SHALL BE TAPPED WITH EACH 6" LIFT.

4. THE 2" SQUARE TUBE POST SHALL BE INSERTED INTO THE 2¼" POST SLEEVE A MINIMUM OF 12".

5. DRIVE CAP SHALL BE UTILIZED FOR INSTALLATION OF DRIVE TUBE FOUNDATION. WHEN USING A POWER DRIVER, A SHANK SHALL ALSO BE REQUIRED.

FOUNDATION TYPE F DETAILS

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.
NOTES:
1. NYLON WASHER SHALL BE 1/8" THICK MINIMUM WITH AN OUTSIDE DIAMETER OF 1" AND AN INSIDE DIAMETER OF 7/8".
2. DRIVE RIVET SHALL BE 3/16" OR 3/32" ALUMINUM FLAT HEAD RIVET WITH NYLON OR RUBBER WASHER.
3. THE HEAD OF ALL DRIVE RIVETS AND HEX HEAD BOLTS SHALL BE POWDER COATED TO MATCH THE COLOR OF THE SIGN SHEETING.
4. DRIVE RIVET SHALL NOT BE USED FOR SIGNS WITHOUT BRACING.

ROAD AND BRIDGE STANDARDS

SQUARE TUBE SIGN POST
SIGN BRACING AND SIGN PANEL ATTACHMENT DETAILS

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE
700
NOTES:

1. SIGN PANEL WIDTHS 36" OR GREATER SHALL REQUIRE SIGN BRACING.

2. VERTICAL SPACING OF SIGN BRACING SHALL NOT EXCEED 12" FROM THE TOP OR BOTTOM EDGE OF SIGN PANEL TO FIRST BRACE AND 36" BETWEEN BRACES. IF THE SPACING BETWEEN BRACES EXCEEDS 36" THEN ADDITIONAL SIGN BRACING SHALL BE ADDED. ALL SIGN BRACING SHALL BE EQUALLY SPACED BETWEEN THE TOP AND BOTTOM BRACE. SEE DETAIL A.

3. MAXIMUM SIGN PANEL AREA PER POST TO BRACE JUNCTION SHALL BE 10 SQ. FT. ADDITIONAL SIGN BRACING SHALL BE INSTALLED IF 10 SQ. FT PER POST TO BRACE JUNCTION IS EXCEEDED.

4. ONE SPLICE PER BRACE WILL BE PERMITTED. BRACE SPLICE SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. BRACING SHALL NOT BE SPLICED WITHIN 6" OF A BRACE TO POST JUNCTION. SPLICES SHALL NOT BE IN VERTICAL ALIGNMENT BUT SHALL BE OFFSET NO LESS THAN 12" FROM EACH OTHER.

5. TOP OF SIGN PANEL SHALL BE MOUNTED 1/2" TO 2" WITH THE TOP OF THE POST AND 1/2" TO 2" WITH THE SIDE OF THE SIGN BRACING. SEE DETAIL B.

6. SIGN PANEL WIDTHS SHALL NOT EXCEED MAXIMUM SPECIFIED.

DETAIL A – SPACING OF MULTIPLE BRACING

DETAIL B – INSTALLATION TOLERANCES
ASSEMBLY TO BE ERECTED 5' FROM THE NOSE OF MEDIAN AND CENTERED IN MEDIAN.

SEE NOTE 2

CURB FACE

MEDIAN

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

NOTE 2

ASSEMBLY TO BE ERECTED 5' FROM THE NOSE OF MEDIAN AND CENTERED IN MEDIAN.

MEDIAN INSTALLATIONS

SINGLE POST

ONE WAY SIGNS ON EXIT RAMPS WITH STOP SIGN

STOP OR YIELD SIGNS AND DO NOT ENTER SIGN (AT EXIT RAMPS ONLY)

NOTES:

1. MOUNTING HEIGHT (h) SHALL BE IN ACCORDANCE WITH STP-1 SHEET 1 OF 12 EXCEPT AS NOTED ON THIS SHEET.

2. 2' MINIMUM FOR MEDIANS OVER 10' IN WIDTH, 12' MINIMUM FOR MEDIANS 10' OR LESS IN WIDTH UNLESS SHOWN OTHERWISE IN THE CONTRACT DOCUMENTS.

3. MOUNTING HEIGHTS (h) ARE MEASURED FROM BOTTOM OF SIGN PANEL TO ROADWAY ELEVATION AT EDGE OF TRAVELWAY OR TOP OF CURB.

ROAD AND BRIDGE STANDARDS

SIGN POST

MOUNTING HEIGHTS OF SIGN INSTALLATIONS

VIRGINIA DEPARTMENT OF TRANSPORTATION
NOTE:

1. Foundation locations shall be approved by engineer prior to installation in accordance with Section 700.

2. Maximum mounting height (h) for the bottom-most sign panel(s) shall be 8 feet, except when necessary to achieve minimum vertical clearance beneath sign panel as per Note 3.

3. Minimum vertical clearance (distance between bottom of sign panel and finished grade beneath the panel) shall be 7 feet for any portion of the sign within the clear zone. This minimum vertical clearance may be reduced to 5 feet for either of the following conditions:
   - When signs or portions of signs are located more than 10 feet up a cut slope greater than 3:1, or
   - When the sign is located at least the minimum distance behind curb, barrier, or guardrail as per Note 4.

4. The lateral clearance to the sign panel shall be a minimum of 2 feet from the face of curb or 4 feet from face of barrier, if present. Unless otherwise approved by the engineer, signs placed behind guardrail shall be located such that the near-side edge of the sign panel is outside of the guardrail deflection distance.
**VIRGINIA DEPARTMENT OF TRANSPORTATION**

**REFERENCE SPECIFICATION**

**SIGN POST**

- S3 x 5.7
- W4 x 13

**Dimensions**

- **SLOPE 3:1 TO 2:1**
- **DIAMETER**
- **LENGTH**
- **SQ. FT.**
  - 3'-0"
  - 4'-6"
  - 4'-4"
  - 5'-0"
  - 5'-6"
  - 5'-9"
  - 6'-0"
  - 6'-3"
  - 6'-9"
  - 7'-0"
  - 7'-3"
  - 7'-6"
  - 8'-0"
  - 8'-3"
  - 8'-6"
  - 9'-0"
  - 9'-3"
  - 9'-6"
  - 10'-0"
  - 10'-3"
  - 10'-6"
  - 11'-0"
  - 11'-3"
  - 11'-6"
  - 12'-0"
  - 12'-3"
  - 12'-6"
  - 13'-0"
  - 13'-3"
  - 13'-6"
  - 14'-0"
  - 14'-3"
  - 14'-6"

**SIGN PANEL**

- 3'
- 4'
- 5'
- 6'

**STUB POST**

- **ELEVATION**

**FOUNDATION**

- **DIAMETER**

**SECTION D-D**

**NOTES:**

1. **POST LENGTH IS FOR ESTIMATING PURPOSES ONLY. THE CONTRACTOR SHALL DETERMINE THE ACTUAL POST LENGTH AT THE FIELD LOCATION OF THE SIGN STRUCTURE BASED ON FINISHED GRADE ELEVATION.**

2. **TOTAL POST LENGTH QUANTITY - LENGTH OF POST ABOVE THE BOLT KEEPER PLATE + THE FOUNDATION STUB POST LENGTH (2'-0").**

**SIGN POST AND FOUNDATION DETAILS**

<table>
<thead>
<tr>
<th>STRUCTURE TYPE</th>
<th>SIGN PANEL DIMENSIONS</th>
<th>SIGN POST</th>
<th>POST LENGTH (SEE NOTES 1 &amp; 2)</th>
<th>FOUNDATION DIMENSIONS</th>
<th>WELDED WIRE MESH</th>
<th>STEEL BASE PLATE</th>
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</thead>
<tbody>
<tr>
<td>VA-A</td>
<td>3' x 3'</td>
<td>W3 x 5.7</td>
<td>12'-3&quot; 3'-0&quot; 1'-0&quot; 2'-6&quot; 5 1/2&quot;</td>
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<tr>
<td>VA-B</td>
<td>4' x 4'</td>
<td>W4 x 13</td>
<td>13'-9&quot; 1'-9&quot; 4'-4&quot; 20 1&quot;</td>
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<td></td>
<td></td>
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<tr>
<td>VA-C</td>
<td>4' x 5'</td>
<td>W4 x 13</td>
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<td>VA-D</td>
<td>5' x 3'</td>
<td>W4 x 13</td>
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<td>6' x 6'</td>
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<td>VA-M</td>
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<td>VA-A2</td>
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<tr>
<td>VA-N</td>
<td>7' x 7'</td>
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<td>VA-O</td>
<td>13' x 5'</td>
<td>W6 x 12</td>
<td>15'-9&quot; 6'-0&quot; 2'-6&quot; 5'-6&quot; 40 1&quot;</td>
<td></td>
<td></td>
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</tbody>
</table>

**NOTES:**

(SEE NOTES 1 & 2)

**VA SIGN STRUCTURE INSTALLATION DETAILS**

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

ROAD AND BRIDGE STANDARDS

REVISION DATE 01/15
SHEET 2 OF 4
1322.11
**SECTION A-A**

**FOR W6 x 12 POST**

**STANDARD INSTALLATION**

- **DIRECTION OF TRAFFIC**
- **SIGN POST**
- **PAYMENT LIMIT FOR SIGN POST**
- **BOLT KEEPER PLATE**
- **20°**
- **A**
- **BOLTS WITH A TORQUE OF 155 INCH POUNDS**
- **TYPE VA-A, USE ¾" DIAMETER HIGH STRENGTH BOLTS WITH HEX HEAD AND HEX NUT AND 3 WASHERS EACH. STAINLESS STEEL OR ASTM A325 BOLTS TO BE INSTALLED WITH TORQUE OF 450 INCH LBS. FOR TYPE VA-A, USE ½" DIAMETER HIGH STRENGTH BOLTS WITH A TORQUE OF 155 INCH POUNDS.**
- **PLATES TO BE SAME MATERIAL AS POST**
- **TOP OF FOUNDATION AT CENTERLINE OF POST**
- **FOUNDATION STUB POST (SAME SIZE AS SIGN POST)**
- **REMOVE ALL GALVANIZING RUNS OR BEADS IN WASHER AREA**

**FOR W4 x 13 POST**

**MEDIAN ONLY INSTALLATION**

- **DIRECTION OF TRAFFIC**
- **SIGN POST**
- **PAYMENT LIMIT FOR SIGN POST**
- **BOLT KEEPER PLATE**
- **20°**
- **A**
- **BOLTS WITH A TORQUE OF 155 INCH POUNDS**
- **TYPE VA-A, USE ¾" DIAMETER HIGH STRENGTH BOLTS WITH HEX HEAD AND HEX NUT AND 3 WASHERS EACH. STAINLESS STEEL OR ASTM A325 BOLTS TO BE INSTALLED WITH TORQUE OF 450 INCH LBS. FOR TYPE VA-A, USE ½" DIAMETER HIGH STRENGTH BOLTS WITH A TORQUE OF 155 INCH POUNDS.**
- **PLATES TO BE SAME MATERIAL AS POST**
- **TOP OF FOUNDATION AT CENTERLINE OF POST**
- **FOUNDATION STUB POST (SAME SIZE AS SIGN POST)**
- **REMOVE ALL GALVANIZING RUNS OR BEADS IN WASHER AREA**

**FOR S3 x 5.7 POST**

- **DIRECTION OF TRAFFIC**
- **SIGN POST**
- **PAYMENT LIMIT FOR SIGN POST**
- **BOLT KEEPER PLATE**
- **20°**
- **A**
- **BOLTS WITH A TORQUE OF 155 INCH POUNDS**
- **TYPE VA-A, USE ¾" DIAMETER HIGH STRENGTH BOLTS WITH HEX HEAD AND HEX NUT AND 3 WASHERS EACH. STAINLESS STEEL OR ASTM A325 BOLTS TO BE INSTALLED WITH TORQUE OF 450 INCH LBS. FOR TYPE VA-A, USE ½" DIAMETER HIGH STRENGTH BOLTS WITH A TORQUE OF 155 INCH POUNDS.**
- **PLATES TO BE SAME MATERIAL AS POST**
- **TOP OF FOUNDATION AT CENTERLINE OF POST**
- **FOUNDATION STUB POST (SAME SIZE AS SIGN POST)**
- **REMOVE ALL GALVANIZING RUNS OR BEADS IN WASHER AREA**

**REFERENCE SPECIFICATION**

**VIRGINIA DEPARTMENT OF TRANSPORTATION**

**INSTALLATION DETAILS**

**VA SIGN STRUCTURE**

**ROAD AND BRIDGE STANDARDS**

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

**SPECIFICATION REFERENCE**

700
NOTES:
1. 4" MAXIMUM PROJECTION WHEN MEASURED ABOVE A 60" CHORD ALIGNED RADIAL TO THE CENTERLINE OF THE HIGHWAY AND CONNECTING ANY POINT, WITHIN THE LENGTH OF THE CHORD, ON THE GROUND SURFACE ON THE OTHER SIDE.
2. SEE STANDARD SSP-VIA FOR SHIM DETAIL.

METHOD TO DETERMINE MAXIMUM PROJECTION OF FOUNDATION STUB POST

SHEET 4 OF 4

BOLT KEEPER PLATE DATA

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<thead>
<tr>
<th>POST SHAPE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
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</thead>
<tbody>
<tr>
<td>S3 x 5.7</td>
<td>5 1/2&quot;</td>
<td>4 1/2&quot;</td>
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<td>W4 x 13</td>
<td>7 3/4&quot;</td>
<td>5 1/2&quot;</td>
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<td>W6 x 12</td>
<td>7 1/4&quot;</td>
<td>7&quot;</td>
<td>3/4&quot;</td>
<td>1 1/2&quot;</td>
</tr>
</tbody>
</table>
NOTES:

1. FOUNDATION LOCATIONS SHALL BE APPROVED BY ENGINEER PRIOR TO INSTALLATION IN ACCORDANCE WITH SECTION 700.

2. MINIMUM VERTICAL CLEARANCE (DISTANCE BETWEEN BOTTOM OF SIGN PANEL AND FINISHED GRADE BENEATH THE PANEL) SHALL BE 7 FEET FOR ANY PORTION OF THE SIGN WITHIN THE CLEAR ZONE. THIS MINIMUM VERTICAL CLEARANCE MAY BE REDUCED TO 5 FEET FOR EITHER OF THE FOLLOWING CONDITIONS:
   - WHEN SIGNS OR PORTIONS OF SIGNS ARE LOCATED MORE THAN 10 FEET UP A CUT SLOPE GREATER THAN 3:1, OR
   - WHEN THE SIGN IS LOCATED AT LEAST THE MINIMUM DISTANCE BEHIND CURB, BARRIER, OR GUARDRAIL AS PER NOTE 6.

3. SIGN PANEL SHALL BE DESIGNED IN ACCORDANCE WITH SPD-2, SPD-3 OR SPD-7.

4. THE VERTICAL T-BEAM SHALL BE 2" X 2" D X 1/4" THICK STRUCTURAL ALUMINUM ALLOY 6061-T6 AT A MINIMUM LENGTH OF 6'-0" AND EXTENDED TO THE NEXT HORIZONTAL SUPPORT BAR ON THE SSP-VIA STRUCTURE.

5. THE T-BEAM SHALL BE ATTACHED TO THE SSP-VIA STRUCTURE BY THE FOLLOWING METHODS:
   - T-BEAM FOR THE SPD-2 SIGN PANEL SHALL BE ATTACHED BY USING A MINIMUM OF TWO POST CLIP BOLTS AT EACH CROSS MEMBER.
   - T-BEAM FOR THE SPD-3 SIGN PANEL SHALL BE ATTACHED BY USING TWO ASTM F593, ALLOY 304 STAINLESS STEEL 5/8" DIAMETER-16 UNC BOLT WITH STAINLESS STEEL NUT AND FLAT WASHER AT ZEE BAR CONNECTIONS AND TWO POST CLAMP AND BOLT AT EACH TEE-BAR CONNECTION.
   - T-BEAM FOR THE SPD-7 SIGN PANEL SHALL BE ATTACHED BY USING A MINIMUM OF TWO POST CLAMP AND POST CLAMP BOLTS AT EACH STIFFENER.

6. THE LATERAL CLEARANCE TO THE SIGN PANEL SHALL BE A MINIMUM OF 2 FEET FROM THE FACE OF CURB OR 4 FEET FROM FACE OF BARRIER, IF PRESENT. UNLESS OTHERWISE APPROVED BY THE ENGINEER, SIGNS PLACED BEHIND GUARDRAIL SHALL BE LOCATED SUCH THAT THE NEAR SIDE EDGE OF THE SIGN PANEL IS OUTSIDE OF THE GUARDRAIL DEFLECTION DISTANCE.
NOTE:

1. ALL POST LENGTHS SHALL BE FIELD CHECKED BY CONTRACTOR PRIOR TO FABRICATION.
FURNISH 2 EACH .063" AND 2 EACH .032".
THICK SHIMS PER POLE. SHIMS SHALL BE FABRICATED
FROM BRASS CONFORMING TO ASTM B36 OR FROM STAINLESS
STEEL WITH A MINIMUM CHROMIUM CONTENT OF 11.50%
NO MORE THAN 2 SHIMS SHALL BE USED PER BOLT WITH A
MAXIMUM OF 4 SHIMS PER POST.

SHIM DETAIL

HINGE PLATE DETAIL

FUSE PLATE DETAIL

BOLT KEEPER PLATE

ALTERNATE BOLT KEEPER PLATE

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

INTERSTATE SIGN STRUCTURE
INSTALLATION DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

700
### Connection Base Reference Specification

####蚬PS-VIA Parallel to Face at Footing

<table>
<thead>
<tr>
<th>TYPE VIA</th>
<th>FOOTING DIMENSIONS</th>
<th>BAR P</th>
<th>BAR H</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D</td>
<td>d</td>
<td>LENGTH</td>
</tr>
<tr>
<td>A</td>
<td>2'-3&quot;</td>
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#### Notes:

1. 4" maximum projection when measured above a 60" chord aligned radially to the centerline of the highway and connecting any point, within the length of the chord, on the ground surface on the other side.

**Method to Determine Maximum Projection of Foundation Stub Post**

**Specification Reference**

A Copy of the original sealed and signed drawing is on file in the central office.

**Interstate Sign Structure**

**Installation Details**

**Virginia Department of Transportation**

**Road and Bridge Standards**

**Revision Date**

01/15

1323.13
### Interstate Sign Structure Installation Details

#### SSP-VIA

**Reference Specification**

**Road and Bridge Standards**

A copy of the original sealed and signed drawing is on file in the Central Office.

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**Notes:**

1. Post length is for estimating purposes only. The contractor shall determine the actual post length at the field location of the sign structure based on finished grade elevation.

2. Total post length quantity = length of post above the bolt keeper plate + the foundation stub post length (2'-9").
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#### POST PANEL DIMENSIONS

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### NOTES:

1. POST LENGTH IS FOR ESTIMATING PURPOSES ONLY. THE CONTRACTOR SHALL DETERMINE THE ACTUAL POST LENGTH AT THE FIELD LOCATION OF THE SIGN STRUCTURE BASED ON FINISHED GRADE ELEVATION.

2. TOTAL POST LENGTH QUANTITY = LENGTH OF POST ABOVE THE BOLT KEEPER PLATE + THE FOUNDATION STUB POST LENGTH (2'-9').

---

**REFERENCE SPECIFICATION**

VIRGINIA DEPARTMENT OF TRANSPORTATION

INTERSTATE SIGN STRUCTURE

INSTALLATION DETAILS

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

R&DOT ROAD AND BRIDGE STANDARDS

INTERSTATE SIGN STRUCTURE

INSTALLATION DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

700

REVISION DATE

01/15

SHEET 6 OF 10

1323.15
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2. TOTAL POST LENGTH QUANTITY = LENGTH OF POST ABOVE THE BOLT KEEPER PLATE + THE FOUNDATION STUB POST LENGTH (2'-9").

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.
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**SUPPORT**

**INTERSTATE SIGN STRUCTURE INSTALLATION DETAILS**

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE: 700

ROAD AND BRIDGE STANDARDS

REVISION DATE: 1323.19

SHEET 10 OF 10
NOTES:

1. 1½" DIAMETER WIRE INLETS SHALL BE PROVIDED AT THE FOLLOWING LOCATIONS:
A. ON SPAN STRUCTURES ON THE FRONT LEG OF END POLE 12" BELOW BOTTOM CHORD.
B. ON CANTILEVER STRUCTURES ON POLE 12" BELOW BOTTOM CHORD.
C. ON SPAN STRUCTURES BELOW BOTTOM CHORD AT CENTERLINE BEHIND FIRST SIGN PANEL FROM EACH END POLE.
D. ON CANTILEVER STRUCTURES BELOW BOTTOM CHORD AT CENTERLINE BEHIND FIRST SIGN PANEL FROM POLE.

2. ALL UNUSED WIRE INLETS SHALL BE CAPPED WATER TIGHT.

3. DISTANCE SHALL BE NO LESS THAN THE MINIMUM INDICATED IN GUARDRAIL STANDARDS.

4. NO MORTAR, GROUT, OR CONCRETE SHALL BE PLACED BETWEEN BOTTOM OF BASE PLATE AND TOP OF PEDESTAL.


6. VERTICAL CLEARANCE FOR OVERHEAD SIGN STRUCTURES SHALL BE NO LESS THAN 19 FEET 0 INCH AND NO MORE THAN 21 FEET 0 INCH FROM THE BOTTOM OF THE LOWEST MOUNTED SIGN PANEL TO THE HIGHEST POINT OF THE ROADWAY, UNLESS OTHERWISE SPECIFIED ON THE PLANS. LUMINAIRE ASSEMBLIES SHALL HAVE A VERTICAL CLEARANCE OF NO LESS THAN 17 FEET 6 INCHES FROM THE BOTTOM OF THE ASSEMBLY TO THE HIGHEST POINT OF THE ROADWAY.

7. TOP OF FOUNDATIONS SHALL BE 2'-0" MINIMUM ABOVE FINISHED GRADE, FOR FOUNDATIONS ADJACENT OR WITHIN A SIDEWALK, TOP OF FOUNDATIONS SHALL BE A MINIMUM OF 3" ABOVE FINISHED GRADE.

8. FOUNDATIONS SHALL NOT BE LOCATED IN A DRAINAGE DITCH.
TYPICAL SOCKETED BASE PLATE CONNECTION

NOTES:
1. ALL POLES/UPRIGHTS OF OVERHEAD SIGN STRUCTURES INCLUDING "BUTTERFLY" STRUCTURES SHALL HAVE A MINIMUM OF SIX ANCHOR BOLTS, EACH HAVING A MINIMUM DIAMETER OF 1\(\frac{1}{2}\)".
2. THE MINIMUM BASE PLATE THICKNESS FOR ALL TYPES OF SIGN STRUCTURES SHALL BE 2".
3. ALL END POLE COLUMNS SHALL BE JOINED TO THE BASE PLATE USING A SOCKETED CONNECTION.
NOTES:

1. ALL SECONDARY MEMBERS IN BOTH TUBULAR AND NON-TUBULAR STRUCTURES IN THE OVERHEAD TRUSS AND THE END POLE SUPPORTS SHALL BE JOINED TO PRIMARY MEMBERS USING A GUSSET CONNECTION PLATE.

2. CONTRACTOR SHALL SPECIFY THE WIDTH, LENGTH, AND THICKNESS OF GUSSET PLATE.

3. CONTRACTOR SHALL SPECIFY THE MINIMUM WELD SIZE AND LENGTH OF WELD.

4. COPE HOLES TO BE PROVIDED AT BOTH ENDS AND BOTH FACES OF ALL SECONDARY MEMBER CONNECTIONS.
TYPICAL SIGN FOOTING DETAIL WITH CONDUIT

NOTES:

THE TYPE, SIZE, NUMBER AND ORIENTATION OF CONDUITS ENTERING AND EXITING FOOTINGS MAY VARY PER SIGN LOCATION.

IN ADDITION TO THE CONDUITS SPECIFIED ON THE PLANS, ONE - 1" CONDUIT REQUIRED FOR GROUND WIRE AND TWO - 2" PVC HEAVY WALL CONDUITS REQUIRED FOR FUTURE USE. FUTURE USE CONDUITS SHALL BE STUBBED OUT AND CAPPED.

FUTURE USE CONDUITS SHALL BE ORIENTED TO RUN PARALLEL TO THE ROADWAY. FOR LOCATION OF FUTURE USE CONDUITS IN FOUNDATIONS FOR DOUBLE END POLE STRUCTURES, SEE DRAWING AT RIGHT.

EACH FOUNDATION SHALL BE PERMANENTLY MARKED TO INDICATE ALL SIDES FROM WHICH CONDUITS PASS. THIS MARK SHALL BE MADE WITH A TROWEL WHEN FINISHING THE CONCRETE AND SHALL BE 1/4" DEEP AND 4" TO 6" LONG. LOCATIONS OF EMPTY CONDUITS SHALL HAVE AN ADDITIONAL 2" LONG MARK MADE PERPENDICULAR TO AND CENTERED ON THIS MARK.

FOUNDATIONS ABOVE FINISHED GRADE SHALL BE CHAMFERED 3/8" ON ALL EDGES.

GROUNDING BUSHINGS SHALL BE INSTALLED ON EACH END OF METAL CONDUITS.

BELL ENDS SHALL BE INSTALLED ON EACH END OF PVC CONDUITS.

BELL ENDS & BUSHINGS OF EMPTY CONDUITS SHALL BE PLUGGED TO PREVENT MOISTURE AND RODENT ENTRY.

VOIDS REMAINING AFTER CONDUCTORS EXIT OR ENTER BELL ENDS OR BUSHINGS OF CONDUITS SHALL BE SEALED WITH SILICONE TO PREVENT MOISTURE AND RODENT ENTRY.

NO MORTAR, GROUT, OR CONCRETE SHALL BE PLACED BETWEEN BOTTOM OF BASE PLATE AND TOP OF FOUNDATION.

LOCATION OF FUTURE USE CONDUITS FOR DOUBLE END POLE STRUCTURES

** FUTURE USE CONDUITS PLACED PARALLEL TO THE ROADWAY

** FUTURE USE CONDUITS PLACED AT AN ANGLE TO MISS THE BACK FOUNDATION OR ANCHOR BOLTS IN A SPREAD FOOTING FOUNDATION.

A COPY OF THE ORIGINAL SEALED AND SIGNED STANDARD DRAWING IS ON FILE IN THE CENTRAL OFFICE.

OVERHEAD SIGN STRUCTURE FOUNDATION DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION
ELECTRIC DETAILS FOR SIGN LIGHTING
SPAN SIGN STRUCTURE

FRONT VIEW

SECTION A-A

1/4" HOLE THROUGH POLE FOR EYE BOLT FOR OVERHEAD SERVICE ONLY.

PHOTOELECTRIC CONTROL
SERVICE ENTRANCE HEAD
RIGID METAL CONDUIT
SAFETY SWITCH
CONTACTOR
LIQUID TIGHT FLEXIBLE METAL CONDUIT

FRONT VIEW

SECTION B-B

1/4" HOLE THROUGH POLE FOR EYE BOLT FOR OVERHEAD SERVICE ONLY.

PHOTOELECTRIC CONTROL
SERVICE ENTRANCE HEAD
RIGID METAL CONDUIT
SAFETY SWITCH
CONTACTOR
RIGID METAL CONDUIT

NOTE:
A SAFETY SWITCH SHALL BE INSTALLED ON ALL SIGN STRUCTURES REQUIRING ELECTRICAL POWER. ELECTRICAL SERVICE FOR SIGN STRUCTURES NOT CONTROLLED BY A CONTROL CENTER SHALL HAVE A PHOTOCCELL AND A PHOTOCELL CONTROLLED CONTACCTOR TO CONTROL THE ELECTRICAL POWER TO LUMINAIRES. THE CONTACCTOR SHALL BE IN A NEMA 3R ENCLOSURE LOCATED WITHIN 24 INCHES OF THE SAFETY SWITCH.

ALL CONDUIT LOCATED IN OR ON OVERHEAD SIGN STRUCTURE SHALL BE 3/4" MINIMUM.
NOTE:

LUMINAIRE RETRIEVAL SYSTEM INCLUDING ELECTRICAL SYSTEM SHALL BE EQUAL TO "LUMI-TRAK" AND DESIGNED FOR THE NUMBER OF LUMINAIRES INDICATED ON THE PLANS. SPACING OF HANGERS USED TO SUPPORT THE RETRIEVAL SYSTEM SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. TURNTABLE END SHALL BE OF SUFFICIENT LENGTH TO ALIGN WITH THE VERTICAL EDGE OF THE OUTSIDE PAVED SHOULDER (+6") OR SHALL BE EXTENDED 5 FEET BEYOND THE VERTICAL EDGE (+0") OF THE OUTERMOST SIGN LUMINAIRE, WHICHEVER IS GREATER. THE OPPOSITE END OF THE RETRIEVAL SYSTEM SHALL EXTEND A MINIMUM OF 6 INCHES PAST THE OUTERMOST VERTICAL EDGE OF THE SIGN HANGER ARM.

LUMINAIRES AND LUMINAIRE RETRIEVAL SYSTEM REQUIRED ONLY WHERE INDICATED ON THE PLANS.
SIGN HANGER ERECTION DETAIL WITH LUMINAIRE

WHEN NO LUMINAIRE RETRIEVAL SYSTEM IS REQUIRED

ALUMINUM SIGN HANGER W4 X 3.06 PLACED NO GREATER THAN 2-3" FROM THE LEFT AND RIGHT EDGES OF SIGN PANEL AND THEN SPACED 4'-6" O.C. MAXIMUM.

TOP OF SIGN SHALL BE TILTED TOWARDS TRAFFIC SO THAT THE SIGN FACE IS 3" FROM VERTICAL.

SIGN PANEL FACE

LUMINAIRE MOUNTING BRACKET 1/8" THICK, SIZED TO FIT LUMINAIRE

LUMINAIRE

4'-0"

LUMINAIRE BRACKET - (TYP.) (WHEN SIGN LIGHTING IS REQUIRED)

SECTION D-D

CONDUIT

HANGER W4 X 3.06

LUMINAIRE MOUNTING BRACKET

SECTION A-A

SECTION B-B

SECTION D-D

NOTE

LUMINAires REQUIRED WHERE INDICATED ON THE PLANS.

LUMINAIRE TO BE ATTACHED TO MOUNTING BRACKET WITH FOUR 3/8" DIA. GALVANIZED CAP SCREWS, LOCKWASHERS AND NUTS.

OVERHEAD SIGN STRUCTURE

HANGER AND LUMINAIRE DETAIL

VIRGINIA DEPARTMENT OF TRANSPORTATION
SIGN PANEL DESIGN

SECTION A-A

ALL INSTALLATIONS EXCEPT TOP AND BOTTOM ZEE BARS ON OVERHEAD SIGNS

3/16" DIAMETER RIVET - RIVETS SHALL BE DOME HEAD, BREAK MANDREL, BLIND RIVETS CONFORMING TO INDUSTRIAL FASTENERS INSTITUTE STANDARD IF-1-14, STYLE 1, GRADES 10 OR 11 EXCEPT THAT THE MINIMUM ULTIMATE TENSILE STRENGTH SHALL BE 360 POUNDS. RIVETS SHALL HAVE A GRIP RANGE ACCOMMODATING THE COMBINED THICKNESS OF THE SIGN PANEL AND ZEE BAR AND SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER’S RECOMMENDATIONS.

SECTION B-B

TOP AND BOTTOM ZEE BAR INSTALLATION ON OVERHEAD SIGNS

ASTM F593, ALLOY 304 STAINLESS STEEL 3/16" DIAMETER - 16 UNC X 3/4" LENGTH CARRIAGE BOLT WITH STAINLESS STEEL NUT AND FLAT WASHER

SIGN FACE

0.010" THICK ALUMINUM BACKING STRIP (MATERIAL SAME AS SIGN PANEL)

RIVET (SAME AS USED FOR CONNECTING SIGN TO ZEE BAR), IN LIEU OF USING RIVETS, TAPE EQUAL TO 3M’S VHB DOUBLE COATED ACRYLIC FOAM TAPE MAY BE USED EXCEPT ON HORIZONTAL BACKING STRIP. TAPE SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER’S RECOMMENDATIONS.
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**Zee Bar**

VDOT
ROAD AND BRIDGE STANDARDS

**SIGN PANEL DESIGN**

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE 701

**Sheet 2 of 2**

Revision Date 4/09

1325.11
THE REFLECTIVE SHEETING APPLIED TO EXTRUDED PANELS SHALL EXTEND APPROX. 3/4" OVER EACH SIDE IN THE NARROW DIRECTION AND SHALL BE ADHERED TO THE PANEL.

EXPOSED SURFACE

FULL PANEL

DETAIL A

DETAIL B

DETAIL C

NOTES:

1. ALUMINUM PANELS MAY HAVE SQUARE CORNERS OR NOTCHED CORNERS AS SHOWN. NO OTHER TYPE CORNERS ARE ACCEPTABLE.

2. ALTERNATE DIMENSIONS INDICATED IN PARENTHESES ARE ACCEPTABLE.

EXTRUDED SIGN PANEL DESIGN

VIRGINIA DEPARTMENT OF TRANSPORTATION
**EXTRUDED SIGN PANEL DESIGN**

**NOTE:**
- Edge strip shall be placed on both sides of all extruded panel signs.
- Double post clips shall be installed on all sign hangers.
- All sign panels installed on overhead sign structures shall be bolted directly to the sign hanger members at the bottom and top row and post clips shall be used at all other mounting points.

**SPECIFICATION REFERENCE**
701

**ROAD AND BRIDGE STANDARDS**
- Sheet 2 of 2
- Revision Date: 4/09

**VIRGINIA DEPARTMENT OF TRANSPORTATION**
### SIGN PANEL DESIGN

#### SIGN PANEL ATTACHMENT DETAILS

<table>
<thead>
<tr>
<th>SIGN PANEL DIMENSIONS</th>
<th>SIGN PANEL ATTACHMENT DETAILS</th>
<th>ZEE BAR</th>
<th>TEE CLAMPS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>W</strong></td>
<td><strong>H</strong></td>
<td><strong>a</strong></td>
<td><strong>b</strong></td>
</tr>
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<td>12'</td>
<td>4'</td>
<td>2'-'0&quot;</td>
<td>8'-'0&quot;</td>
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<tr>
<td>11'</td>
<td>5'</td>
<td>1'-'6&quot;</td>
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<td>10'</td>
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<td>10'</td>
<td>4'-'10&quot;</td>
<td>12'-'4&quot;</td>
</tr>
</tbody>
</table>

**NOTE:**
- ZEE: Zero Erosion Effect
- TEE: Tee Clamp
- ZEE OR TEE: As required

**Diagram:**

- ZEE
- TEE OR ZEE

**Type Via Sign Foundation**

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**SPECIFICATION REFERENCE**

701

**ROAD AND BRIDGE STANDARDS**

**REVISION DATE**

1325.30

**SHEET 1 OF 3**

**VIRGINIA DEPARTMENT OF TRANSPORTATION**
### SIGN PANEL ATTACHMENT DETAILS

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<td>20'</td>
<td>9'</td>
</tr>
<tr>
<td>VARIOUS 2'-6&quot;</td>
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</table>

**Diagram:**

- **ZEE:**
- **TEE:**
- **Type Via Sign Foundation**

**Specifications:**

- **Date:** 4/09
- **Reference:** 701

**Virginia Department of Transportation**

**Road and Bridge Standards**

**Sheet 2 of 3**

**SPD-3**
SIGN PANEL DESIGN

ZEE BARS

<table>
<thead>
<tr>
<th>TYPE</th>
<th>SIZE</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2(\frac{3}{4})&quot; x 1(\frac{1}{2})&quot; x (\frac{3}{8})&quot;</td>
<td>1.00 LBS./FT.</td>
</tr>
<tr>
<td>B</td>
<td>3&quot; x 2(\frac{3}{4})&quot; x 1(\frac{1}{4})&quot;</td>
<td>2.40 LBS./FT.</td>
</tr>
<tr>
<td>C</td>
<td>4&quot; x 2(\frac{3}{4})&quot; x 1(\frac{1}{8})&quot;</td>
<td>2.93 LBS./FT.</td>
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<tr>
<td>D</td>
<td>5&quot; x 3(\frac{1}{4})&quot; x (\frac{3}{8})&quot;</td>
<td>4.13 LBS./FT.</td>
</tr>
<tr>
<td>E</td>
<td>6&quot; x 3(\frac{1}{2})&quot; x (\frac{3}{8})&quot;</td>
<td>5.08 LBS./FT.</td>
</tr>
</tbody>
</table>

POST CLAMP DETAIL

GALVANIZED GRAY - IRON OR ALUMINUM CASTING

CENTERLINE HOLE FOR \(\frac{3}{4}\)" DIAMETER SQUARE HEAD STAINLESS STEEL BOLT X 2\(\frac{1}{4}\)" LONG WITH SELF-LOCKING NUT AND ONE FLAT WASHER.

SERRATE \(\frac{1}{6}\)" DEEP AT \(\frac{1}{6}\)" CENTERS

\(\frac{3}{16}\)" OR \(\frac{1}{16}\)" LEG OF CLAMP IS FOR ADJUSTMENT TO POST FLANGE

\(\frac{3}{16}\)" DIAMETER RIVET. RIVETS SHALL BE DOME HEAD, BREAK MANDREL, BLIND RIVETS CONFORMING TO INDUSTRIAL FASTENERS INSTITUTE STANDARD IFI-114, STYLE 1, GRADES 10 OR 11 EXCEPT THAT THE MINIMUM ULTIMATE TENSILE STRENGTH SHALL BE 360 POUNDS. RIVETS SHALL HAVE A GRIP RANGE ACCOMMODATING THE COMBINED THICKNESS OF THE SIGN PANEL AND ZEE BAR AND SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

ROAD AND BRIDGE STANDARDS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

700
701

REVISION DATE SHEET 3 OF 3

1325.32
Unless otherwise noted, the top of the sign panel shall not extend above the sign post no greater than the distance of \( \frac{1}{2} \) c.
RIVETS SHALL BE DOME HEAD, BREAK MANDREL, BLIND RIVETS CONFORMING TO INDUSTRIAL FASTENERS INSTITUTE STANDARD IFI-114, STYLE 1, GRADES 10 OR 11 EXCEPT THAT THE MINIMUM ULTIMATE TENSILE STRENGTH SHALL BE 360 POUNDS. RIVETS SHALL HAVE A GRIP RANGE ACCOMMODATING THE COMBINED THICKNESS OF THE SIGN PANEL AND ZEE BAR AND SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

<table>
<thead>
<tr>
<th>STRUCTURE TYPE</th>
<th>SIGN PANEL DIMENSIONS</th>
<th>VEE BAR SPACING CHART</th>
</tr>
</thead>
<tbody>
<tr>
<td>VA-A</td>
<td>3' x 3'</td>
<td>W</td>
</tr>
<tr>
<td>VA-B</td>
<td>4' x 4'</td>
<td>1-3/8</td>
</tr>
<tr>
<td>VA-C</td>
<td>4' x 4'</td>
<td>1-3/8</td>
</tr>
<tr>
<td>VA-D</td>
<td>5' x 5'</td>
<td>1-3/8</td>
</tr>
<tr>
<td>VA-E</td>
<td>6' x 6'</td>
<td>1-3/8</td>
</tr>
<tr>
<td>VA-F</td>
<td>7' x 7'</td>
<td>1-3/8</td>
</tr>
<tr>
<td>VA-G</td>
<td>5'-2&quot; x 5'-0&quot;</td>
<td>1-3/8</td>
</tr>
<tr>
<td>VA-H</td>
<td>5'-0&quot; x 5'-0&quot;</td>
<td>1-3/8</td>
</tr>
<tr>
<td>VA-J</td>
<td>6'-0&quot; x 6'-0&quot;</td>
<td>1-3/8</td>
</tr>
<tr>
<td>VA-L</td>
<td>7'-0&quot; x 7'-0&quot;</td>
<td>1-3/8</td>
</tr>
<tr>
<td>VA-M</td>
<td>8'-0&quot; x 8'-0&quot;</td>
<td>1-3/8</td>
</tr>
<tr>
<td>VA-N</td>
<td>9'-0&quot; x 9'-0&quot;</td>
<td>1-3/8</td>
</tr>
</tbody>
</table>

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.
ALUMINUM FRAMING

SIGN PANEL ATTACHMENT DETAILS
(For sign panel attachment to Z bars, see standard SPD-1)

- NYLON WASHER
- 3/8" 2024-T351 ALUMINUM BOLT
- 2024-T4 ALUMINUM WASHER AND 6262-T9 ALUMINUM HEX NUT
- 2" x 2" x 1/8" ALUMINUM ANGLE ALLOY 6061-T6

NOTES

- NYLON WASHER SHALL BE 1/4" THICK MINIMUM WITH AN OUTSIDE DIAMETER OF 1" AND AN INSIDE DIAMETER OF 3/4".

- TO OBTAIN A FLUSH MOUNTING SURFACE FOR SIGNS, ALL WOOD POST SHALL BE MORTISED WHERE NECESSARY TO RECESS THE FLANGE OF ALUMINUM ANGLE.

- THE TYPE A ZEE BARS SHALL BE 2 3/4" X 1/4" X 1/4".

- ALL VERTICAL AND HORIZONTAL SPACING BETWEEN SIGNS IN AN ASSEMBLY SHALL BE ONE INCH UNLESS SPECIFIED.

- THESE ARE TYPICAL SIGN PANEL ASSEMBLIES; ALL ASSEMBLIES SHALL BE IN ACCORDANCE WITH PLAN DETAILS.
A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

NOTE:

rivets shall be used for securing the stiffeners to the sign unless otherwise specified or approved, and shall be % minimum diameter by % long aluminum and capable of withstanding a minimum shear force of 460 Lbs. Rivet spacing for attaching the stiffeners to the sign panel shall be ft maximum beginning ft from the ends of the sign panel.

See standard SPD-4 for post clamp and bolt details.

Unless otherwise noted the top of the sign panel shall not extend above the sign post no greater than the distance of ft.
LARGE STIFFENER SPLICE

THE MAXIMUM NUMBER OF SPLICES IN A STIFFENER SHALL BE ONE PER STIFFENER LOCATION.

SPLICES SHALL NOT BE IN A VERTICAL ALIGNMENT BUT SHALL BE OFFSET 12" FROM EACH OTHER.
<table>
<thead>
<tr>
<th>W</th>
<th>H</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>STIFFENER NO.</th>
<th>SIZE</th>
<th>W</th>
<th>H</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>STIFFENER NO.</th>
<th>SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>12'</td>
<td>4'</td>
<td>2' - 0&quot;</td>
<td>8' - 0&quot;</td>
<td>11 1/2&quot;</td>
<td>2' - 1&quot;</td>
<td>2</td>
<td>LARGE</td>
<td>12'</td>
<td>10&quot;</td>
<td>2' - 0&quot;</td>
<td>8' - 0&quot;</td>
<td>4&quot;</td>
<td>2' - 4&quot;</td>
<td>5</td>
<td>LARGE</td>
</tr>
<tr>
<td>11'</td>
<td>5'</td>
<td>1' - 6&quot;</td>
<td>8' - 0&quot;</td>
<td>1'1/2&quot;</td>
<td>2' - 0&quot;</td>
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<td>1' - 8&quot;</td>
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<td>22'</td>
<td>9&quot;</td>
<td>4' - 5&quot;</td>
<td>13' - 2&quot;</td>
<td>5&quot;</td>
<td>1' - 2&quot;</td>
<td>8</td>
<td>LARGE</td>
</tr>
<tr>
<td>20'</td>
<td>8'</td>
<td>4' - 0&quot;</td>
<td>12' - 0&quot;</td>
<td>3&quot;</td>
<td>1' - 6&quot;</td>
<td>6</td>
<td>LARGE</td>
<td>24'</td>
<td>9&quot;</td>
<td>4' - 10&quot;</td>
<td>14' - 5&quot;</td>
<td>4&quot;</td>
<td>10&quot;</td>
<td>11</td>
<td>LARGE</td>
</tr>
<tr>
<td>22'</td>
<td>8'</td>
<td>4' - 5&quot;</td>
<td>13' - 2&quot;</td>
<td>6&quot;</td>
<td>12&quot;</td>
<td>8</td>
<td>LARGE</td>
<td>26'</td>
<td>9&quot;</td>
<td>5' - 2&quot;</td>
<td>15' - 7&quot;</td>
<td>2&quot;</td>
<td>8&quot;</td>
<td>14</td>
<td>LARGE</td>
</tr>
<tr>
<td>24'</td>
<td>8'</td>
<td>4' - 10&quot;</td>
<td>14' - 5&quot;</td>
<td>3&quot;</td>
<td>9&quot;</td>
<td>11</td>
<td>LARGE</td>
<td>12'</td>
<td>12&quot;</td>
<td>2' - 0&quot;</td>
<td>8' - 0&quot;</td>
<td>2&quot;</td>
<td>2' - 1&quot;</td>
<td>6</td>
<td>LARGE</td>
</tr>
<tr>
<td>26'</td>
<td>8'</td>
<td>5' - 2&quot;</td>
<td>15' - 7&quot;</td>
<td>0&quot;</td>
<td>8&quot;</td>
<td>13</td>
<td>LARGE</td>
<td>14'</td>
<td>12&quot;</td>
<td>2' - 10&quot;</td>
<td>8' - 5&quot;</td>
<td>0</td>
<td>3' - 0&quot;</td>
<td>5</td>
<td>LARGE</td>
</tr>
<tr>
<td>10'</td>
<td>10'</td>
<td>1' - 0&quot;</td>
<td>8' - 0&quot;</td>
<td>6&quot;</td>
<td>2' - 0&quot;</td>
<td>6</td>
<td>LARGE</td>
<td>16'</td>
<td>12&quot;</td>
<td>3' - 2&quot;</td>
<td>9' - 7&quot;</td>
<td>2&quot;</td>
<td>2' - 4&quot;</td>
<td>6</td>
<td>LARGE</td>
</tr>
<tr>
<td>18'</td>
<td>16'</td>
<td>3' - 7&quot;</td>
<td>10' - 10&quot;</td>
<td>6&quot;</td>
<td>1' - 8&quot;</td>
<td>10</td>
<td>LARGE</td>
<td>18'</td>
<td>16&quot;</td>
<td>3' - 7&quot;</td>
<td>10' - 10&quot;</td>
<td>6&quot;</td>
<td>1' - 8&quot;</td>
<td>10</td>
<td>LARGE</td>
</tr>
</tbody>
</table>

**SIGN PANEL DESIGN**

**SIGN PANEL ATTACHMENT DETAILS**

**STIFFENER**

**NO. SIZE**

**SPD-7**

**ROAD AND BRIDGE STANDARDS**

**REVISION DATE 4/09**

**SHEET 3 OF 3**

**VIRGINIA DEPARTMENT OF TRANSPORTATION**

**SPECIFICATION REFERENCE 701**

**1325.72**
OCTAGON

EQUILATERAL TRIANGLE

DIAMOND

INTERSTATE SHIELD

SQUARE

VERTICAL RECTANGLE

NOTE:
ALL HOLES SHALL BE 3/8" IN DIAMETER.
HORIZONTAL RECTANGLE

<table>
<thead>
<tr>
<th>Q</th>
<th>R</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>18&quot; 6&quot; 1/2&quot;</td>
<td>18&quot; 12&quot; 1/2&quot;</td>
<td>20&quot; 6&quot; 1/2&quot;</td>
</tr>
<tr>
<td>21&quot; 15&quot; 1/2&quot;</td>
<td>24&quot; 9&quot; 1/2&quot;</td>
<td>24&quot; 12&quot; 1/2&quot;</td>
</tr>
<tr>
<td>24&quot; 18&quot; 3&quot;</td>
<td>30&quot; 15&quot; 1/2&quot;</td>
<td>30&quot; 24&quot; 3&quot;</td>
</tr>
<tr>
<td>36&quot; 12&quot; 1/2&quot;</td>
<td>54&quot; 24&quot; 3&quot;</td>
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</tr>
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</table>

PENTAGON

<table>
<thead>
<tr>
<th>T</th>
<th>U</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>30&quot; 24&quot; 3&quot;</td>
<td>38&quot; 24&quot; 3&quot;</td>
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</tbody>
</table>

CIRCLE

<table>
<thead>
<tr>
<th>W</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>15&quot; 12&quot;</td>
<td>18&quot; 15&quot;</td>
</tr>
</tbody>
</table>

ISOSCELES TRIANGLE

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>40&quot; 30&quot; 7 1/2&quot; 12&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48&quot; 30&quot; 9&quot; 15&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PUNCHING REQUIREMENTS FOR SIGN PANELS
SINGLE POST INSTALLATIONS
VIRGINIA DEPARTMENT OF TRANSPORTATION

ROAD AND BRIDGE STANDARDS
REVISION DATE SHEET 2 OF 2
1326.11
NOTES:

SPECIAL Delineators are made from aluminum alloy, not less than 0.080 thick conforming to ASTM B209, Alloy 6061-T6 or 5052-H38.

Delineators extend 1" above the top of the post.

Delineators are reflectorized, and in all cases, the color shall conform to the color of the edgelines, alternating with a black stripe.

The stripes shall slope down toward the center of roadway.

Delineators shall be mounted on U-type posts fabricated from rolled-rail steel, 1.33 lb./ft. minimum.

The bottom of the delineator panel shall be 12" above the pavement edge elevation.
INTERSTATE ROAD EDGE DELINEATORS
TYPICAL DETAILS

NOTES:
ROAD EDGE DELINEATORS ARE TO BE ERECTED TWO FEET BEYOND THE OUTER EDGE OF THE SHOULDER OR THE FACE OF UNMOUNTABLE CURB.

D-1 DELINEATORS SHALL BE PLACED ON THE RIGHT OF THROUGH ROADWAYS AT 528 FOOT SPACING WITH THE FOLLOWING EXCEPTIONS:

- TANGENT ROADWAYS WHERE PAVEMENT MARKERS ARE INSTALLED WILL NOT REQUIRE THE INSTALLATION OF DELINEATORS.
- LOCATIONS WHERE DELINEATORS ARE INSTALLED ON GUARDRAILS, PARAPETS OR BARRIERS ON THE RIGHT OF THE ROADWAY WILL NOT REQUIRE THE INSTALLATION OF ROAD EDGE DELINEATORS.
- D-1 DELINEATORS SHALL BE PLACED ON AT LEAST ONE SIDE AND ON THE OUTSIDE CURVE OF INTERCHANGE RAMPS EXCEPT WHERE DELINEATORS ARE INSTALLED ON GUARDRAILS, PARAPETS OR BARRIERS. THE SPACING ALONG THE RAMPS SHALL BE AT 100' INTERVALS EXCEPT IN HORIZONTAL CURVES WHERE THE SPACING SHALL CONFORM TO THE CHART ON SPACING FOR HIGHWAY DELINEATORS.
- D-2 DELINEATORS SHALL BE PLACED ON ACCELERATION AND DECELERATION LANES AT 100' SPACING.
- THE COLOR OF DELINEATORS SHALL CONFORM TO THE COLOR OF THE ADJACENT EDGELINES.

SPACING FOR HIGHWAY DELINEATORS ON HORIZONTAL CURVES

DISTANCE IN FEET ROUNDED TO THE NEAREST 5'.

<table>
<thead>
<tr>
<th>RADIUS OF CURVE IN FEET</th>
<th>SPACING ON CURVE IN FEET</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>70</td>
</tr>
<tr>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>150</td>
<td>35</td>
</tr>
<tr>
<td>200</td>
<td>30</td>
</tr>
<tr>
<td>250</td>
<td>20</td>
</tr>
<tr>
<td>300</td>
<td>15</td>
</tr>
<tr>
<td>350</td>
<td>10</td>
</tr>
<tr>
<td>400</td>
<td>5</td>
</tr>
<tr>
<td>450</td>
<td>3</td>
</tr>
<tr>
<td>500</td>
<td>2</td>
</tr>
<tr>
<td>550</td>
<td>1</td>
</tr>
<tr>
<td>600</td>
<td>0.5</td>
</tr>
<tr>
<td>650</td>
<td>0</td>
</tr>
<tr>
<td>700</td>
<td>0.5</td>
</tr>
<tr>
<td>750</td>
<td>0</td>
</tr>
<tr>
<td>800</td>
<td>0.5</td>
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<tr>
<td>850</td>
<td>0</td>
</tr>
<tr>
<td>900</td>
<td>0.5</td>
</tr>
<tr>
<td>950</td>
<td>0</td>
</tr>
<tr>
<td>1000</td>
<td>0.5</td>
</tr>
</tbody>
</table>


SPECIFICATION REFERENCES
702

ROAD AND BRIDGE STANDARDS

REVISION DATE 6-15-09 SHEET 1 OF 1

1327.20
NOTES:

DRIVING CAP TO BE USED WHEN DRIVING POST.

PANEL TO BE FABRICATED OF ASTM B209 ALLOY 6061-T6 OR 5052-H38, 0.080 THICK.

TOP OF PANEL TO BE FLUSH WITH TOP OF POST.

ERECTION

MILEPOST MARKERS TO BE LOCATED IN LINE WITH DELINEATOR POSTS, EDGE OF SHOULDOR OR BACK OF GUARDRAIL, IF PRESENT.
NOTES:

1. ALL PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH THESE STANDARDS, THE MUTCD, AND THE VIRGINIA SUPPLEMENT TO THE MUTCD, UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.

2. THE PAVEMENT MARKING FOR THE LANE LINE AND EDGE LINE MARKINGS OF INTERSTATE HIGHWAYS AND FREEWAYS SHALL BE 6" WIDE; ALL OTHER HIGHWAYS THE PAVEMENT MARKING SHALL BE 4" WIDE UNLESS OTHERWISE NOTED IN THE CONTRACT DOCUMENTS.

3. CONTINUE EDGELINE WIDTH TO THE TERMINATION POINT SPECIFIED IN THE CONTRACT DOCUMENTS.

4. IF GORE AREA HATCHING IS PROVIDED, THERE SHALL BE A MINIMUM OF THREE CHEVRONS. SPACING MAY BE REDUCED IN ORDER TO FIT THIS MINIMUM.
1. All pavement markings shall be installed in accordance with these standards, the MUTCD and the Virginia Supplement to the MUTCD, unless otherwise specified in the contract documents.

2. The pavement marking for the lane line and edge line markings of interstate highways and freeways shall be 6" wide; all other highways the pavement marking shall be 4" wide unless otherwise noted in the contract documents.

3. Continue edgeline width to the termination point specified in the contract documents.

4. If gore area hatching is provided, there shall be a minimum of three chevrons. Spacing may be reduced in order to fit this minimum.

A copy of the original sealed and signed drawing is on file in the central office.
PATTERNS OF LONGITUDINAL LINES

THRU LANES: USE BROKEN LINE (10' LINE SEGMENTS / 30' GAPS).
TAPERS MORE THAN 100': USE DOTTED EXTENSION (2' LINE SEGMENTS / 4' GAPS).
TAPERS 100' OR LESS: DO NOT USE DOTTED EXTENSION UNLESS SPECIFIED IN THE CONTRACT DOCUMENTS.

NOTES:

1. STOP LINES SHALL BE 24 INCHES IN WIDTH.
2. ALL PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH THESE STANDARDS, THE MUTCD, AND THE VIRGINIA SUPPLEMENT TO THE MUTCD, UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.
3. THE LOCATION, WIDTH, AND TYPE OF THE PAVEMENT MARKINGS SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.
4. TURN ARROWS SHALL BE IN ACCORDANCE WITH SHEET 3.
5. CROSSWALK MARKINGS, IF PROVIDED, SHALL BE IN ACCORDANCE WITH SHEET 4.

10' WHITE LINE SEGMENT
30' GAP

YELLOW EDGE LINE

4' MIN.
30' MAX.

BOTTOM OF ARROW AT BEGINNING OF FULL WIDTH TURN LANE.

4' MIN.

DOTTED EXTENSION
2' WHITE LINE SEGMENT
4' GAP

SOLID WHITE LINE TO END OF TAPER UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.
NOTES:

1. STOP LINES SHALL BE 24 INCHES IN WIDTH.

2. ALL PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH THESE STANDARDS, THE MUTCD, AND THE VIRGINIA SUPPLEMENT TO THE MUTCD, UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.

3. THE LOCATION, WIDTH, AND TYPE OF THE PAVEMENT MARKINGS SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

4. TURN ARROWS SHALL BE IN ACCORDANCE WITH SHEET 3.

5. CROSSWALK MARKINGS, IF PROVIDED, SHALL BE IN ACCORDANCE WITH SHEET 4.

THRU LANES: USE BROKEN LINE (10' LINE SEGMENTS / 30' GAPS).
TAPERS MORE THAN 100' USE DOTTED EXTENSION (2' LINE SEGMENTS / 4' GAPS).
TAPERS 100' OR LESS: DO NOT USE DOTTED EXTENSION UNLESS SPECIFIED IN THE CONTRACT DOCUMENTS.

PATTERNS OF LONGITUDINAL LINES

10' WHITE LINE SEGMENT
30' GAP

YELLOW EDGE LINE

DOTTED EXTENSION
2' WHITE LINE SEGMENT
4' GAP

BOTTOM OF ARROW AT BEGINNING OF FULL WIDTH TURN LANE.

DOUBLE SOLID YELLOW LINE

100' MIN. SOLID WHITE LINE

10' SOLID WHITE LINE TO END OF TAPER UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.

DETAIL FOR OPTIONAL STAGGERED STOP LINES (ON A LANE-BY-LANE BASIS)
### Turn Arrows

Turn arrows required in accordance with the following, unless otherwise specified in the contract documents.

<table>
<thead>
<tr>
<th>Turn Lane Length</th>
<th>Number and Position of Arrows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 100' (exclusive of taper)</td>
<td>1 arrow located at the beginning of the solid lane line.</td>
</tr>
</tbody>
</table>
| 100’ to 300’ (exclusive of taper) | 2 arrows
  - 1 arrow located at beginning of full width turn lane.
  - 1 arrow located 50’ back from stop line or end of lane line. |
| Greater than 300’ (exclusive of taper) | 3 arrows
  - 1 arrow located at beginning of full width turn lane.
  - 1 arrow located 50’ back from stop line or end of lane line.
  - 1 arrow located at midpoint between the other two arrows. |

### Mandatory Turn Movement Lanes (Drop Lane)

Markings required in accordance with the following, unless otherwise specified in the contract documents.

<table>
<thead>
<tr>
<th>Turn Arrows</th>
<th>Only Word Markings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 arrow located at beginning wide white solid lane line.</td>
<td>Spaced midway between arrows.</td>
</tr>
<tr>
<td>1 arrow located 50’ back from stop line.</td>
<td></td>
</tr>
<tr>
<td>1 arrow located at midpoint of 8” wide solid lane line.</td>
<td></td>
</tr>
</tbody>
</table>

### Notes:

1. All pavement markings shall be installed in accordance with these standards, the MUTCD, and the Virginia Supplement to the MUTCD, unless otherwise specified in the contract documents.
2. The location, width, and type of the pavement markings shall be as specified in the contract documents.
3. When "only" word markings are used, these markings shall be spaced midway between the turn arrows.
4. Crosswalk markings, if provided, shall be in accordance with sheet 4.

---

**Detail for Location of Edge Lines on Curb Sections of Roadway (No Gutter)**

**Detail for Dotted Extension Through Intersection at Dual Turn Lanes**

**Typical Pavement Marking Intersection Details**

Virginia Department of Transportation
NOTES:

1. ALL PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH THESE STANDARDS, THE MUTCD AND THE VIRGINIA SUPPLEMENT TO THE MUTCD, UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.

2. THE LOCATION, WIDTH, AND TYPE OF THE PAVEMENT MARKINGS SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

3. CROSSWALKS SHALL ALIGN WITH CURB RAMPS IN ACCORDANCE WITH STANDARD CG-12. THE CROSSWALK SHALL BE AT LEAST AS WIDE AS THE LEVEL LANDING AREA OF THE CURB RAMP.

4. WHEN LONGITUDINAL LINES ARE SPECIFIED FOR THE CROSSWALK, THE LONGITUDINAL LINES SHALL BE PARALLEL TO THE PATH OF THRU TRAFFIC.

5. GAPS BETWEEN LONGITUDINAL LINES SHALL BE BETWEEN 2 - 5 FEET. GAP SPACING MAY VARY IN ORDER TO ALIGN LINES SUCH THAT THEY ARE OUTSIDE THE WHEEL PATHS OF THRU TRAFFIC. THE FIRST AND LAST LINES SHALL BE 2' MAXIMUM FROM EDGE OF SHOULDER OR EDGE OF GUTTER PAN.
TURN LANE ARROWS

TURN ARROWS REQUIRED IN ACCORDANCE WITH THE FOLLOWING, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

TURN LANE LENGTH

1. Arrow located at beginning of full width turn lane.
2. Arrow located at midpoint of full width turn lane.
3. Arrow located 50' back from stop bar.

30' OR LONGER: 3 ARROWS

300' OR LESS: 2 ARROWS

SKIPS

THRU LANCES: USE 10' SKIPS / 30' SPACING.
TRANSITIONS MORE THAN 100' USE MINI SKIPS (2' SKIPS / 4' SPACING).
TRANSITIONS 100' OR LESS: DO NOT USE SKIPS

SOLID WHITE LINE TO END OF TRANSITION UNLESS OTHERWISE REQUIRED BY THE ENGINEER.

NOTES:

STOP BARS SHALL BE 2" IN WIDTH AND SHALL BE LOCATED AS SHOWN ON THE TRAFFIC SIGNAL PLANS.
ARROWS SHALL BE IN ACCORDANCE WITH THE MUTCD.
SPACING BETWEEN DOUBLE SOLID YELLOW LINES SHALL BE 4".

NO EDGE LINE REQUIRED WHERE CURB AND GUTTERS ARE PRESENT UNLESS INDICATED BY THE ENGINEER.

VOID

TYPICAL PAVEMENT MARKING
SIGNALIZED INTERSECTIONS

VIRGINIA DEPARTMENT OF TRANSPORTATION

PM-4
NOTES:
1. ALL PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH THESE STANDARDS, THE MUTCD, AND THE VIRGINIA SUPPLEMENT TO THE MUTCD, UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.
2. TAPER LENGTH SHALL BE PER THESE STANDARDS UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.
3. TAPERS MORE THAN 100' USE DOTTED EXTENSION (2' LINE SEGMENTS / 4' GAPS). TAPERS 100' OR LESS: DO NOT USE DOTTED EXTENSION UNLESS SPECIFIED IN THE CONTRACT DOCUMENTS.
4. TURN ARROWS SHALL BE IN ACCORDANCE WITH PM-3.
5. THE PAVEMENT MARKINGS SHALL BE 4' WIDE UNLESS OTHERWISE NOTED IN THE CONTRACT DOCUMENTS.

<table>
<thead>
<tr>
<th>SPEED</th>
<th>TAPER RATIO</th>
<th>10 FT TURN_LANE WIDTH</th>
<th>11 FT TURN_LANE WIDTH</th>
<th>12 FT TURN_LANE WIDTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 30 MPH</td>
<td>8:1</td>
<td>80'</td>
<td>90'</td>
<td>100'</td>
</tr>
<tr>
<td>&gt; 30 MPH</td>
<td>15:1</td>
<td>150'</td>
<td>175'</td>
<td>200'</td>
</tr>
</tbody>
</table>

TYPICAL PAVEMENT MARKING
LEFT TURN PAVEMENT MARKED MEDIAN
VIRGINIA DEPARTMENT OF TRANSPORTATION
NOTES:

1. All pavement markings shall be installed in accordance with these standards, the MUTCD, and the Virginia Supplement to the MUTCD, unless otherwise specified in the contract documents.

2. The pavement markings shall be 4" wide unless otherwise noted in the contract documents.

3. Typical spacing between opposing turn arrows shall be 300 feet. Spacing can be increased or decreased as determined by the engineer.

4. Turn arrows shall be in accordance with PM-3.

5. Stop lines shall be 24 inches in width. Stop lines shall only be used at signalized intersections or on stop-controlled approaches.

6. The detail for Type B may be used in areas where the available storage length is limited.

7. Refer to the taper length table on Sheet 1 for "T". Taper length shall be as specified in the contract documents.

8. Tapers more than 100' use dotted extension (2' line segments / 4' gaps). Tapers 100' or less: do not use dotted extension unless specified in the contract documents.
NOTES:

1. ALL PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH THESE STANDARDS, THE MUTCD, AND THE VIRGINIA SUPPLEMENT TO THE MUTCD, UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.

2. PAVEMENT MARKINGS CONSISTING OF BICYCLIST THRU ARROW AND HELMETED BICYCLIST SYMBOL SHALL BE PLACED JUST PRIOR TO THE BEGINNING OF THE RIGHT TURN LANE TAPER AS SHOWN. THEY SHALL ALSO BE PLACED 6' FROM THE END OF THE SOLID WHITE LINE AT RIGHT TURN LANES IF THE SOLID WHITE LINE SEPARATING THE BICYCLE LANE FROM THE RIGHT TURN LANE IS GREATER THAN 100' IN LENGTH.

3. BICYCLE LANE SYMBOLS SHALL BE PLACED A MAXIMUM OF 500' APART.

4. SEE PM-10 FOR HELMETED BICYCLIST SYMBOL AND ARROW DETAILS.

5. PARKING LANE WIDTH SHALL BE 7' FOR RESIDENTIAL STREETS AND 8' FOR COMMERCIAL AND MIXED-USE STREETS. REFER TO THE VDOT ROAD DESIGN MANUAL FOR ADDITIONAL REQUIREMENTS.

6. DELINEATING BICYCLE LANES WITHIN THE LIMITS OF A REQUIRED PAVED SHOULDER AREA IS NOT PERMITTED.
NOTES:

1. ALL PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH THESE STANDARDS, THE MUTCD, AND THE VIRGINIA SUPPLEMENT TO THE MUTCD, UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.

2. SHARED LANE MARKINGS SHALL NOT BE USED IN PAVED SHOULDERS, IN BICYCLE LANES, OR ON ROADWAYS THAT HAVE A SPEED LIMIT ABOVE 35 MPH.

3. SHARED LANE MARKINGS SHALL BE PLACED IMMEDIATELY AFTER AN INTERSECTION AND SPACED AT INTERVALS NOT GREATER THAN 250 FEET.

4. IN SHARED LANES WITH ON-STREET PARALLEL PARKING, THE CENTER OF THE SHARED LANE MARKINGS SHALL BE AT LEAST 1' FROM THE FACE OF CURB, OR FROM THE EDGE OF PAVEMENT WHERE THERE IS NO CURB.

5. ON STREETS WITHOUT ON-STREET PARKING AND AN OUTSIDE TRAVEL LANE LESS THAN 14' WIDE, THE CENTER OF THE SHARED LANE MARKINGS SHALL BE AT LEAST 4' FROM THE FACE OF CURB, OR FROM THE EDGE OF PAVEMENT WHERE THERE IS NO CURB.

6. SEE PM-10 FOR SHARED LANE MARKING SYMBOL DETAILS.
NOTES:

1. All pavement markings shall be installed in accordance with these standards, the MUTCD, and the Virginia supplement to the MUTCD, unless otherwise specified in the contract documents.

2. On multi-lane roads the transverse bands shall extend across all approach lanes, and individual railroad crossing (RXR) symbols shall be used in each approach lane.

3. See PM-10 for railroad crossing (RXR) symbols details.

4. Refer to the MUTCD for signing requirements at passive grade crossings (no automated traffic control devices).

5. The placement of the grade crossing advance warning (W10-1) sign shall be in accordance with Section 2C.05 and Table 2C-4 (Condition B) of the MUTCD.

6. Yield lines may be used instead of stop lines at passive grade crossings with yield signs installed.
REFERENCE SPECIFICATION

KEY:
- ⊤ TWO WAY TRAFFIC MARKER, WITH POINTS INDICATING RETROREFLECTIVE FACE
- ⊤ ONE WAY TRAFFIC MARKER, WITH POINT INDICATING RETROREFLECTIVE FACE
- → INDICATES DIRECTION OF TRAVEL

MARKERS ADJACENT TO SOLID LINE
MARKERS BETWEEN DOUBLE SOLID LINES
MARKERS SUPPLEMENTING BROKEN LINES

GENERAL PLACEMENT

NOTES:

1. EXACT LOCATIONS OF THE MARKERS SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.

2. TYPICAL SPACING SHALL BE 80' C-C WHEN USED ON A TANGENT SECTION OF ROADWAY OR ON HORIZONTAL CURVES LESS THAN 3°, AND SHALL BE 40' C-C WHEN USED ON HORIZONTAL CURVES OF 3° OR MORE, UNLESS OTHERWISE SHOWN IN THE CONTRACT DOCUMENTS OR AS DIRECTED BY THE ENGINEER. SEE SHEET 2 FOR SPECIFIC EXAMPLES.

3. ALL RAISED PAVEMENT MARKERS SHALL BE INSTALLED AT LEAST 2 INCHES FROM ANY SEAM OR PAVEMENT JOINT.

4. RAISED PAVEMENT MARKERS SHALL BE THE SAME COLOR AS THE ADJACENT PAVEMENT MARKING. THE COLOR OF THE BACKSIDE OF RAISED PAVEMENT MARKERS SHALL BE AS SHOWN IN THE TABLE BELOW.

5. ALL RAISED PAVEMENT MARKERS SHALL BE SNOWPLOWABLE RAISED PAVEMENT MARKERS (SRPMS) UNLESS OTHERWISE NOTED IN THE CONTRACT DOCUMENTS.

6. RAISED PAVEMENT MARKERS SHALL BE OMITTED ON BRIDGE DECKS UNLESS OTHERWISE NOTED IN THE CONTRACT DOCUMENTS.

RAISED PAVEMENT MARKER COLOR

<table>
<thead>
<tr>
<th>MARKER TYPE</th>
<th>BACKSIDE COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONE WAY TRAFFIC</td>
<td></td>
</tr>
<tr>
<td>WHITE SNOWPLOWABLE RAISED</td>
<td>RED</td>
</tr>
<tr>
<td>TEMPORARY</td>
<td>BLANK</td>
</tr>
<tr>
<td>YELLOW SNOWPLOWABLE RAISED</td>
<td>BLANK</td>
</tr>
<tr>
<td>TWO WAY TRAFFIC</td>
<td></td>
</tr>
<tr>
<td>ALL TYPES</td>
<td>MATCH ADJACENT PAVEMENT MARKING</td>
</tr>
</tbody>
</table>

TYPICAL RAISED PAVEMENT MARKER

LOCATION DETAILS

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

ROAD AND BRIDGE STANDARDS

SHEET 1 OF 2
1330.80

REVISION DATE
01/15

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE
704
**Typical Raised Pavement Marker**

**Location Details**

- **Type A**: Exit Ramp
- **Type B**: Entrance Ramp
- **Type C**: Two or Multi-Lane Undivided Highway
- **Type D**: One-Way Passing Zone
- **Type E**: Two-Way Passing Zone
- **Type F**: Two or Multi-Lane Undivided Highway
- **Type G**: Multi-Lane Highway Tangent
- **Type H**: Multi-Lane Highway Horizontal Curves of 3° or More
- **Type J**: Multi-Lane Highway Lane Drop or Auxiliary Lane

**Key:**
- ➤ Two Way Traffic Marker, with points indicating retroreflective face
- ➤ One Way Traffic Marker, with point indicating retroreflective face
- ➤ Indicates direction of travel

**Notes:**
- Markers to be installed a minimum of 80' downstream of theoretical gore.
- 20' C to C Spacing
- Note: shall be used when seam is not located between double yellow line, or when directed by the engineer or contract documents.

**Reference:**
- A copy of the original sealed and signed drawing is on file in the central office.
- Virginia Department of Transportation

**Revision Date:**
- New 01/15

**Road and Bridge Standards:**
- 1330.81
PARALLEL SOLID LINE SPACING (NO PASSING ZONE)

PARALLEL SOLID AND BROKEN LINES
(ONE-WAY PASSING ZONE)

NOTES:
1. THE SPACE BETWEEN TWO PARALLEL LINES SHALL BE 6" WIDE IF RAISED PAVEMENT MARKERS ARE PRESENT BETWEEN THE TWO PARALLEL LINES.
NOTES:
1. STANDARD CHARACTERS ARE 24 GRID UNITS HIGH AND 4 GRID UNITS WIDE (EXCEPT LETTER "I" AND THE NUMBER "1" WHICH ARE 1 GRID UNIT WIDE).
2. VERTICAL STROKES ARE 1 UNIT WIDE, HORIZONTAL STROKES ARE 4 UNITS HIGH.
3. SPACE 1 GRID UNIT MINIMUM BETWEEN CHARACTERS OR AS OTHERWISE SHOWN (OPTICAL SPACING MAY BE USED).

<table>
<thead>
<tr>
<th>APPLICATION</th>
<th>CHARACTER HEIGHT</th>
<th>GRID UNIT SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW SPEED ROADWAYS ≤ 40 MPH</td>
<td>6&quot;</td>
<td>3&quot;</td>
</tr>
<tr>
<td>HIGH SPEED ROADWAYS ≥ 45 MPH</td>
<td>8&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>SCHOOL SYMBOL</td>
<td>10&quot;</td>
<td>5&quot;</td>
</tr>
<tr>
<td>TWO-LANE SCHOOL SYMBOL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

PAVEMENT WORD, SYMBOL, AND ARROW MARKINGS

LETTERS AND NUMERALS DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION
### Square Foot Areas of Pavement Word Markings

<table>
<thead>
<tr>
<th>Legend</th>
<th>Paint Application</th>
<th>Eradication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahead</td>
<td>17.5 30.5 42.0 75.0</td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>14.0 24.5 33.0 59.0</td>
<td></td>
</tr>
<tr>
<td>Bike</td>
<td>13.0 23.0 28.5 51.0</td>
<td></td>
</tr>
<tr>
<td>Bump</td>
<td>15.0 26.5 33.0 59.0</td>
<td></td>
</tr>
<tr>
<td>East</td>
<td>13.0 22.5 33.0 59.0</td>
<td></td>
</tr>
<tr>
<td>Ends</td>
<td>15.0 27.0 33.0 59.0</td>
<td></td>
</tr>
<tr>
<td>FT</td>
<td>5.0 9.0 15.0 27.0</td>
<td></td>
</tr>
<tr>
<td>Hump</td>
<td>14.5 25.5 33.0 59.0</td>
<td></td>
</tr>
<tr>
<td>Lane</td>
<td>13.5 23.5 33.0 59.0</td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td>11.0 20.0 33.0 59.0</td>
<td></td>
</tr>
<tr>
<td>Merge</td>
<td>19.0 34.0 42.0 75.0</td>
<td></td>
</tr>
<tr>
<td>MPH</td>
<td>11.0 19.5 24.0 43.0</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>8.0 13.5 15.0 27.0</td>
<td></td>
</tr>
<tr>
<td>North</td>
<td>17.5 30.5 42.0 75.0</td>
<td></td>
</tr>
<tr>
<td>ONLY</td>
<td>12.0 21.5 30.5 53.5</td>
<td></td>
</tr>
<tr>
<td>PED</td>
<td>11.0 19.0 24.0 43.0</td>
<td></td>
</tr>
<tr>
<td>RIGHT</td>
<td>14.5 26.0 37.5 67.0</td>
<td></td>
</tr>
<tr>
<td>SCHOOL</td>
<td>(see Notes 1 and 2) 34.5 (one lane) (see Notes 1 and 2) 91.0 (one lane)</td>
<td></td>
</tr>
<tr>
<td>SIGNAL</td>
<td>15.5 28.0 46.5 83.0</td>
<td></td>
</tr>
<tr>
<td>SLOW</td>
<td>13.5 24.0 33.0 59.0</td>
<td></td>
</tr>
<tr>
<td>SOUTH</td>
<td>16.5 29.0 42.0 75.0</td>
<td></td>
</tr>
<tr>
<td>STOP</td>
<td>12.5 22.5 33.0 59.0</td>
<td></td>
</tr>
<tr>
<td>TO</td>
<td>6.0 10.5 15.0 27.0</td>
<td></td>
</tr>
<tr>
<td>TURN</td>
<td>13.5 24.0 33.0 59.0</td>
<td></td>
</tr>
<tr>
<td>US</td>
<td>7.0 12.5 15.0 27.0</td>
<td></td>
</tr>
<tr>
<td>WEST</td>
<td>14.0 24.5 33.0 59.0</td>
<td></td>
</tr>
<tr>
<td>XING</td>
<td>12.0 21.0 28.5 51.0</td>
<td></td>
</tr>
<tr>
<td>YIELD</td>
<td>13.5 24.0 37.5 67.0</td>
<td></td>
</tr>
</tbody>
</table>

### Notes:
1. One-lane application of "School" symbol is 8' high. When installed in a single lane with a width less than 10.5', the letters shall be separated by four inches. When installed in a single lane with a width greater than 10.5', the letters shall be separated by four inches.
2. Two-lane application of "School" symbol is 10' high with paint application area of 53.5 sq. ft. and eradication area of 193.0 sq. ft.
3. Non-linear eradication area is based on a "Theoretical Box" defined by the outermost limits of the non-linear pavement marking that includes both the painted and non-painted areas that encompass the total word message or symbol. See example.
4. On undivided roadways, symbol and message pavement markings shall not extend beyond the centerline into opposing travel lanes.

#### Example (8' Letters)

**Theoretical Box**

Eradication Area = 8' x 9'-4" = 74.7 sq. ft.

![Theoretical Box Example](image-url)
### Square Foot Areas of Symbols and Arrows

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Paint Application</th>
<th>Eradication</th>
</tr>
</thead>
<tbody>
<tr>
<td>↑</td>
<td>Thru Arrow</td>
<td>12.0</td>
<td>32.0</td>
</tr>
<tr>
<td>OR</td>
<td>Single Turn Arrow (Left or Right)</td>
<td>17.5</td>
<td>51.0</td>
</tr>
<tr>
<td>OR</td>
<td>Double Turn Arrow (Left/Through or Right/Through)</td>
<td>28.5</td>
<td>96.0</td>
</tr>
<tr>
<td>OR</td>
<td>Triple Turn Arrow (Left/Through/Right)</td>
<td>37.5</td>
<td>127.5</td>
</tr>
<tr>
<td>OR</td>
<td>Double Turn Arrow (Left/Right)</td>
<td>27.0</td>
<td>80.0</td>
</tr>
<tr>
<td>OR</td>
<td>Lane-Reduction Arrow (Left or Right)</td>
<td>44.0</td>
<td>99.0</td>
</tr>
<tr>
<td>OR</td>
<td>Wrong-Way Arrow</td>
<td>24.0</td>
<td>133.5</td>
</tr>
<tr>
<td>△</td>
<td>Fish-Hook Lane-Use Arrow for Roundabouts (Left)</td>
<td>20.5</td>
<td>81.0</td>
</tr>
<tr>
<td>△</td>
<td>Fish-Hook Lane-Use Arrow for Roundabouts (Left/Through)</td>
<td>31.0</td>
<td>114.5</td>
</tr>
<tr>
<td>△</td>
<td>Fish-Hook Lane-Use Arrow for Roundabouts (Left/Through/Right)</td>
<td>39.5</td>
<td>195.0</td>
</tr>
<tr>
<td>△</td>
<td>Fish-Hook Lane-Use Arrow for Roundabouts (Through/Right)</td>
<td>31.5</td>
<td>142.0</td>
</tr>
<tr>
<td></td>
<td>Optional Oval for Fish-Hook Lane-Use Arrow for Roundabouts</td>
<td>3.5</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>HoV Diamond Symbol (Asphalt Surface)</td>
<td>11.5</td>
<td>39.0</td>
</tr>
<tr>
<td></td>
<td>HoV Diamond Contrast Symbol (Concrete Surface)</td>
<td>35.5</td>
<td>70.0</td>
</tr>
<tr>
<td>▷</td>
<td>Yield Line Triangle (1' x 1.5')</td>
<td>0.75 (Each)</td>
<td>1.5 (Each)</td>
</tr>
<tr>
<td>▷</td>
<td>Yield Line Triangle (2' x 3')</td>
<td>3.0 (Each)</td>
<td>6.0 (Each)</td>
</tr>
</tbody>
</table>

**Theoretical Box**

Eradication Area Example (Triple Turn Arrow)

Eradication Area = 12'-9" x 10'-0" = 127.5 SQ.FT.

**Theoretical Box**

Eradication Area Example (Triple Turn Arrow)
NOTES:
1. 1 GRID UNIT = 4 INCHES
2. ALL SYMBOLS/LEGEND SHALL BE WHITE UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.
TURN TURN ARROW
(LEFT/THRU/RIGHT)

DOUBLE TURN ARROW
(LEFT/RIGHT)

NOTES:
1. 1 GRID UNIT = 4 INCHES
2. ALL SYMBOLS/LEGEND SHALL BE WHITE UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.
NOTES:

1. 1 GRID UNIT = 6 INCHES

2. ALL SYMBOLS/LEGEND SHALL BE WHITE UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.

LANE REDUCTION ARROW (LEFT)

LANE REDUCTION ARROW (RIGHT)

SHOWN FOR CLARITY 1 GRID UNIT = 1 FOOT

WRONG-WAY ARROW

FISH-HOOK LANE-USE ARROW FOR ROUNDABOUTS

OPTIONAL FOR LEFT-MOST LANE

MATCH ARROW(S) WITH LANE USE

CENTER POINT OF ELLIPSES

1 GRID UNIT = 6 INCHES

NOTE:

1. 1 GRID UNIT = 6 INCHES

2. ALL SYMBOLS/LEGEND SHALL BE WHITE UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.
NOTES:

1. 1 GRID UNIT = 4 INCHES
2. ALL SYMBOLS/LEGEND SHALL BE WHITE UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.
NOTES:
1. 1 GRID UNIT = 4 INCHES
2. ALL SYMBOLS/LEGEND SHALL BE WHITE UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.

HELMETED BICYCLIST SYMBOL

SHARED LANE MARKING SYMBOL

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ROAD AND BRIDGE STANDARDS

PAVEMENT WORD, SYMBOL, AND ARROW MARKINGS

SYMBOL DETAILS

A. 1 GRID UNIT = 4 INCHES
B. ALL SYMBOLS/LEGEND SHALL BE WHITE UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.

PM-10

REFERENCE SPECIFICATION

VIRGINIA DEPARTMENT OF TRANSPORTATION
NOTES:
1. 1 GRID UNIT = 6 INCHES
2. ALL SYMBOLS/LEGEND SHALL BE WHITE UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.

YIELD AHEAD TRIANGLE - SMALL

YIELD AHEAD TRIANGLE - LARGE

RAILROAD CROSSING SYMBOL

SYMBOL DETAILS

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

A-01/15 00

ROAD AND BRIDGE STANDARDS

PAVEMENT WORD, SYMBOL, AND ARROW MARKINGS

VIRGINIA DEPARTMENT OF TRANSPORTATION
NOTES:

1. 1 GRID UNIT = 2 INCHES

2. ALL SYMBOLS/LEGEND SHALL BE WHITE UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.
## SQUARE FOOT AREAS OF ROUTE SHIELD SYMBOLS

<table>
<thead>
<tr>
<th>Description</th>
<th>Paint Application</th>
<th>Eradication</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Symbol Height</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15.0 FT</td>
<td>17.5 FT</td>
</tr>
<tr>
<td></td>
<td>20.0 FT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15.0 FT</td>
<td>17.5 FT</td>
</tr>
<tr>
<td></td>
<td>20.0 FT</td>
<td></td>
</tr>
<tr>
<td>2 DIGITS INTERSTATE SHIELD (ON LIGHT OR DARK PAVEMENT)</td>
<td>72.0</td>
<td>98.0</td>
</tr>
<tr>
<td>3 DIGITS INTERSTATE SHIELD (ON LIGHT OR DARK PAVEMENT)</td>
<td>90.0</td>
<td>122.5</td>
</tr>
<tr>
<td>1 OR 2 DIGITS U.S. ROUTE SHIELD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ON LIGHT PAVEMENT</td>
<td>27.5</td>
<td>37.5</td>
</tr>
<tr>
<td>ON DARK PAVEMENT</td>
<td>90.0</td>
<td>122.5</td>
</tr>
<tr>
<td>3 DIGITS U.S. ROUTE SHIELD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ON LIGHT PAVEMENT</td>
<td>37.5</td>
<td>50.5</td>
</tr>
<tr>
<td>ON DARK PAVEMENT</td>
<td>112.5</td>
<td>153.5</td>
</tr>
<tr>
<td>2 DIGITS VA PRIMARY RTE SHIELD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ON LIGHT PAVEMENT</td>
<td>27.5</td>
<td>37.0</td>
</tr>
<tr>
<td>ON DARK PAVEMENT</td>
<td>90.0</td>
<td>122.5</td>
</tr>
<tr>
<td>3 DIGITS VA PRIMARY RTE SHIELD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ON LIGHT PAVEMENT</td>
<td>37.0</td>
<td>50.5</td>
</tr>
<tr>
<td>ON DARK PAVEMENT</td>
<td>112.5</td>
<td>153.5</td>
</tr>
<tr>
<td>3 DIGITS VA SECONDARY RTE SHIELD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ON LIGHT PAVEMENT</td>
<td>30.0</td>
<td>41.0</td>
</tr>
<tr>
<td>ON DARK PAVEMENT</td>
<td>90.0</td>
<td>122.5</td>
</tr>
<tr>
<td>4 DIGITS VA SECONDARY RTE SHIELD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ON LIGHT PAVEMENT</td>
<td>31.0</td>
<td>42.0</td>
</tr>
<tr>
<td>ON DARK PAVEMENT</td>
<td>112.5</td>
<td>153.5</td>
</tr>
</tbody>
</table>

### THEORETICAL BOX

**ERADICATION AREA EXAMPLE**

(15' SYMBOL HEIGHT)

**ERADICATION AREA** - 15'-0" x 6'-0" = 90.0 SQ.FT.
2 DIGITS INTERSTATE SHIELD ON DARK OR LIGHT PAVEMENT

3 DIGITS INTERSTATE SHIELD ON DARK OR LIGHT PAVEMENT

NOTES:

1. SEE TABLE FOR GRID UNIT (GU) SIZE AND SHIELD AND NUMERICAL DIMENSIONS.
2. FOR THE NUMBER "1", DIVIDE NUMERAL WIDTH BY 4.

<table>
<thead>
<tr>
<th>GRID UNIT (GU) SIZE</th>
<th>SHIELD HEIGHT</th>
<th>SHIELD WIDTH</th>
<th>NUMERAL DIMENSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2 DIGITS</td>
<td>3 DIGITS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HEIGHT</td>
<td>HEIGHT</td>
</tr>
<tr>
<td>6&quot;</td>
<td>15'-0&quot;</td>
<td>6'-0&quot;</td>
<td>8'-0&quot;</td>
</tr>
<tr>
<td>7&quot;</td>
<td>17'-6&quot;</td>
<td>7'-0&quot;</td>
<td>8'-9&quot;</td>
</tr>
<tr>
<td>8&quot;</td>
<td>20'-0&quot;</td>
<td>8'-0&quot;</td>
<td>10'-8&quot;</td>
</tr>
</tbody>
</table>

REFERENCE SPECIFICATION:

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

ROAD AND BRIDGE STANDARDS

PAVEMENT WORD, SYMBOL, AND ARROW MARKINGS

ROUTE SHIELD DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

704
NOTES:

1. SEE TABLE FOR GRID UNIT (GU) SIZE AND SHIELD AND NUMERAL DIMENSIONS.

2. FOR THE NUMBER "1", DIVIDE NUMERAL WIDTH BY 4.

GRID UNIT (GU) SIZE | SHIELD HEIGHT | SHIELD WIDTH | NUMERAL DIMENSIONS
---|---|---|---
6" | 15'-0" | 6'-0" | 7'-6" | 9'-0" | 1'-6"
7" | 17'-6" | 7'-0" | 8'-9" | 10'-6" | 1'-9"
8" | 20'-0" | 8'-0" | 10'-0" | 12'-0" | 2'-0"

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.
NOTES:
1. See Table for grid unit (GU) size and
   shield and numeral dimensions.
2. For the number "1"; divide numeral
   width by 4.

<table>
<thead>
<tr>
<th>GRID UNIT (GU) SIZE</th>
<th>SHIELD HEIGHT</th>
<th>SHIELD WIDTH</th>
<th>NUMERAL DIMENSIONS</th>
<th>WIDTH (SEE NOTE 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot;</td>
<td>15'-0&quot;</td>
<td>6'-0&quot;</td>
<td>7'-0&quot;</td>
<td>9'-0&quot;</td>
</tr>
<tr>
<td>7&quot;</td>
<td>17'-0&quot;</td>
<td>7'-0&quot;</td>
<td>8'-0&quot;</td>
<td>10'-0&quot;</td>
</tr>
<tr>
<td>8&quot;</td>
<td>20'-0&quot;</td>
<td>8'-0&quot;</td>
<td>10'-0&quot;</td>
<td>12'-0&quot;</td>
</tr>
</tbody>
</table>
NOTES:
1. SEE TABLE FOR GRID UNIT (GU) SIZE AND SHIELD AND NUMERAL DIMENSIONS.
2. FOR THE NUMBER "1", DIVIDE NUMERAL WIDTH BY 4.